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By Griff Borgeson

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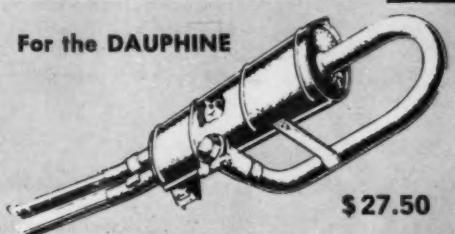
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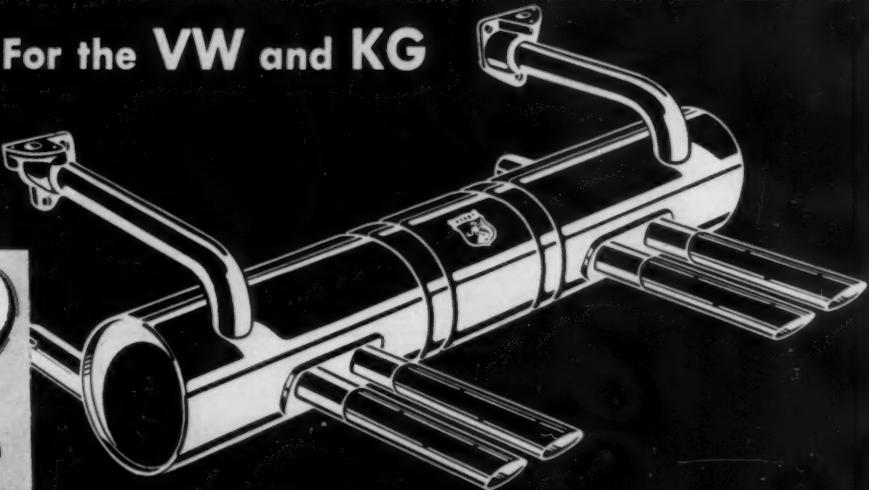
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SPORTS CARS ILLUSTRATED

May 1958
no. 11 vol. 3

CONTENTS

road tests

Elva Mk II	19
Saab 93B	30
Porsche 1600 Coupe	38

features

Mountain Madness	Robert Halmi 24
<i>The Monte Carlo Rallye</i>	
Charlie Lucky and the G.P. Pignatelli	Robert Lurie 28
<i>A lesson in sponsorship</i>	
Not Enough Odds	D. M. Bartley 40
<i>Fangio's comments on his abduction</i>	

technical

Build it Right	Ken Miles 26
<i>Conclusion</i>	
Harry Miller's Cars from Mars	Griff Borgeson 32
<i>Miller-Gulf, 20 years too early?</i>	

competition

The Fastest Kilometer	Griff Borgeson 22
<i>Two records come home</i>	

departments

Very Sincerely Yours	6
Letters	8
Technotes	12
New Products	16



Phil Hill, who is storming the big 4.9 Ferrari on this month's cover, has done well enough by the marque to be listed by FIA as a Grade One driver. Kodachrome by Bob Coogan.

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ZIFF-DAVIS PUBLISHING CO., 1 Park Ave., New York 17, N. Y. WILLIAM ZIFF, President; H. J. MORGANROTH, Vice President; MICHAEL H. FROELICH, Vice President; MICHAEL MICHAELSON, Vice President and Circulation Director; ALBERT GRUEN, Art Director.

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BRANCH OFFICES: Midwestern Office, 64 E. Lake St., Chicago, Ill.; Western Office, Room 412, 215 W. 7th St., Los Angeles 17, Calif.; John E. Payne, manager.



SPORTS CARS ILLUSTRATED is published monthly by the Ziff-Davis Publishing Company, William B. Ziff, Chairman of the Board (1946-1953), at 64 E. Lake St., Chicago 1, Ill. Entered as second class matter at Post Office, Chicago, Illinois, under the Act of March 3, 1879. Authorized by Post Office Department, Ottawa, Canada, as second class matter.

SUBSCRIPTION RATES: One year, U.S. and Possessions and Canada \$4.00; Pan American Union Countries \$4.50; all other foreign countries \$5.00.

SUBSCRIPTION SERVICE: All correspondence concerning subscriptions should be addressed to Circulation Dept., 64 E. Lake St., Chicago 1, Ill. Please allow at least four weeks for change of address. Include your old address as well as new — enclosing if possible an address label from a recent issue of this magazine.

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very sincerely yours:

FINALLY, AFTER THE HANDWRITING on the wall has become well and thoroughly dried, we hear that Detroit is seriously looking into what they term somewhat superciliously the small car. And well they might.

Year after succeeding year the Body Politic has had jammed down its collective throat a ballooning series of increasingly tin-wrapped *bolides*. The expense of all this useless extra iron-mongery has been borne perforce by the customer in several ways. First is the initial cost of the metal, second is the added labor to install the stuff, third is the extra fuel needed to lug it around and finally and most important is the fact that if the metal is damaged (as it almost inevitably is) the cost of repair or replacement requires a running account at the corner loan emporium. Underneath all this tin is . . . more tin. Shrouds and shields shield cover every imaginable form of torque-gobbling accessory which in turn covers every part of the engine. The result is that a simple spark plug cleaning that used to run a couple of dollars now larrups the poor (a word used advisedly) owner a thick 15 to 20 dollars. Other service functions are worse.

The public has finally and at long last just plain rebelled.

Why in the name of every deity should a man be forced to roll around in a boudoir-decorated, metal and glass greenhouse, wallet shuddering every mile, when for one half to one third the initial cost and one quarter the operating price he can have something that will do exactly the same thing? The answer is plain. He doesn't have to be so coerced and will not be.

Mind you, for cruising five to six hundred miles a day along a super turnpike or freeway system the Detroiter does the job and does it well — much better in fact than the smaller of the "small cars." But the fact remains that the large majority of the motoring public does NOT so travel more than about once a year which makes for pretty expensive day-to-day transportation. Those that do so travel don't need the excess tonnage of chromed pot-metal.

The day has finally arrived when the mark of your man of sense and sanity is not the price of his transportation but the economy of it.

We speak not here of sports cars — these are the final product, the mark of the man who has been thoroughly weaned, the man who has made a clean break with mediocrity, the man who has determined that his existence is to be more than vegetable. For those not quite ready for such weaning, which by this time has become something akin to brain-washing for the larger mass of the motoring public, there is, thank heaven, the small car. With its obvious acceptance will come a better appreciation for honest driving and for the sports car and the enthusiasm of those of us who are its devotees.

Perhaps the age of the mechanical moron is on the wane.

— john christy

OH YEA!



"FOR ALL THE DOUGH I WAS STICKING INTO THAT BABY I WANTED TO BE DARN SURE I WAS GETTIN' MY MONEY'S WORTH. SO ME 'EN THE SALESMAN TOOK 'ER FOR A SPIN. WE CAME TO THIS STRAIGHT AWAY AND MAN DID I POUR THE COALS TO HER . . ."

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letters

UNOFFICIAL OFFICIAL?

I have been following the races for two years, helping out as a pit mechanic. I would like to know whether the SCCA knows what goes on at regional events. We, who are trying to do a job, are consistently at the mercy of people who call themselves officials but seem more like the friends of someone who have talked themselves into the pits—into our hair. Just last summer, some fat little fellow who looked like he belonged guarding a harem somewhere instead of within hearing distance of a car, almost got himself killed while crossing the track to get the officials' stand. I know because our car almost left the track to avoid him.

Must we be subjected to this kind of thing? If the SCCA is so concerned about safety and driver competence *et al* why don't they set an example, and screen their officials more carefully. We know what we're doing—do they?

F. S. Roberts
Nyack, N. Y.

SUPER SPORTS

As a subscriber to SCI I read with great interest your February article on Lloyd Taylor's "Super Sports" engine. In the article you included every conceivable bit of information—except where Mr. Taylor might be contacted regarding future purchase of his engine. I would appreciate it if you could supply this.

Donald M. Bye
Cedar Rapids, Iowa
Write O'Ce Ritch, 1631 Leycross Dr., La Canada, Calif. Mr. Ritch is handling contact work for Mr. Taylor.—Ed.

WHICH COMES FIRST . . .

The question of the compulsory use of fireproof clothing has been hotly debated within the California Sports Car Club, especially since my good friend Lou Brero was burned to death last year in Hawaii. My own feelings in this matter are these: practically every accident that occurs is basically the result of driver error and it is reasonable to assume that a high proportion of these errors of judgment are due to some extent to fatigue; in Southern California it is HOT, and heat can cause not only fatigue but in conjunction with nervous strain, noise, discomfort and a certain amount of physical effort can cause complete collapse, indeed we have had some of our drivers collapse at the wheel from heat exhaustion.

Now I believe that I stand a very much better chance of not getting burned if I am not involved in an accident than if I am wearing fireproof clothing, and I know that I drive better, my judgment is more acute and I am less likely to become involved in an accident if I am not suffering from heat exhaustion. For this reason, I feel safer wearing, in hot weather, the cool, comfortable polo shirt or "T" shirt. The possibility of being burned is in any event remote, the possibility of serious injury if I make a mistake is immediate and apparent.

In this part of the world, the "safety"

feature of fireproof clothing actually increases the hazard and probability of accidents.

Ken Miles
Hollywood, Calif.

FROM FAR AWAY PLACES

Perhaps you will be glad to hear your splendid magazine is known also here in Poland. I am one of the enthusiasts of the "Sports Cars." (sic.) As you collect data of small cars, I am sending you some photographs of my DKW sports car. The engine has a displacement of 690 cm³, the car has front wheel drive and an aluminum body. The lady sitting inside the car is my wife.

If you will insert a photograph of my car in your magazine, please enclose my best regards to all American sports cars owners, especially to those who are of Polish descent.

Jan Ziembicki
Bielawa, Poland



A HALT TO BUICK BLASTS

Slowly I have watched SCI degenerate to an issue obviously appealing to a larger circulation and, of course, more revenue. But after suffering through articles proclaiming the prowess of Furies, 300C's . . . I have been driven to this brief explanation for my present disinterest in SCI. The last straw was in your last issue in which praises of glory were heaped on none other than the Battleship-Buick for some fictitious brake improvements. This article, and recent appearances of SCI editors on TV proclaiming Buick's award, are so obviously insincere and intended only as advertising and revenue vehicles, that I have lost what little confidence I had left in your magazine.

. . . Sorry to have to say this, but you've driven me to it!

Charles O. Parker II
Brookline, Mass.

Let's get one thing straight right now. The improvements in the Buick brakes are by no means fictitious. These are virtually the same brakes as those developed for the Corvette SS and which were designed specifically for the brake-punishing Sebring grind. The interesting thing is that they were designed with the requirements of mass production in mind as is shown on the '58 Buicks. The wonder is that they didn't also show up on the '58 Chevies, especially the Corvettes. In all actuality, we had little to gain and much to lose by giving our first award to Buick. This is still Sports Cars Illustrated, and as such we are concerned primarily with sporting equipment. However, we take pride in being international, not anti-national, in scope. When an American manufacturer produces a piece of engineering that means more satisfactory driving for its customers and safer driving for those who will be on the same road with owners of that product, we will be only too happy to recognize the fact. We do not consider Buick to be in any sense a sports car or anything close to it, but it does have brakes that would be a credit to any sports car.—Ed.



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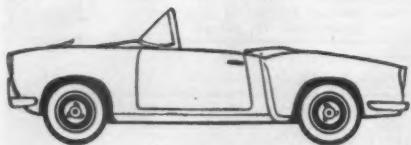
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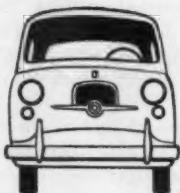
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MARION'S MEANDERINGS

By
Marion Weber

Hi, there! Well, like it's Spring most places and if you have any red blood left in your alcohol veins, you'll certainly want to be sharpening up your car for the pleasurable driving months ahead . . . vacations, even. So, see how these good things grab you. If you are enthused, simply send money. That's all there is to it. We do all the hard work, such as packing, shipping, etc. You don't even have to pay postage, except on a few extra heavy items which are priced real low, anyhow. For example: Our tops and tonneau covers. We have arranged to keep our special sale prices in force for a few weeks longer so that you can take advantage of them: MGA TONNEAU COVER Only \$18.95. 3-ply de luxe fabric, 18 month written guarantee, all trim and metal fittings included and full, easy instructions let you install it at home and save even more. (Mfg. list on this is \$33.50, you know) Other tonneaus such as Jag, Porsche, & 190SL at \$29.95 . . . sensational! REPLACEMENT TOPS as low as \$29.95 for all imported roadsters. Available in 3-ply fabric or best super Vinyl. Really save on these babies. VOLKSWAGON SUN ROOFS, easily installed by you: \$15.93 (fabric) \$16.93 (Vinyl).

WRITE FOR OUR NEW SPRING CATALOG FOR FULL DETAILS

Maybe after a long hard winter your carpets are a little worse for wear? Dig this: Full replacement carpets for TC TD TF & A, Healey, Jag, T Bird, Corvette in wool or nylon (please specify) ready to snap or tack into place, only \$28.50. Imagine, all pieces cut from original pattern and fully bound. Colors: brown, black, tan, red, maroon, blue, green . . . or send swatch.

Here's a new idea, and a practical one: A Continental Kit for the MGA. This gets the spare tire out of the trunk and makes it useable for lots of luggage and lets you put objects behind the seats, too. The kit is sturdy, attaches to existing mounts, is rattle-free and does not require any holes to be drilled, period. It is not braced to thin body metal, but is self supporting and adds plenty of protection to the rear end. The added use you will get from the trunk makes it well worth the price . . . \$69.50 (freight collect). If you don't want to go that strong but feel you need the room, grab one of our good looking demountable luggage racks. Polished chrome and lacquered wood combined to make an exceptionally handsome rack. Fits MGA, TR, Healey, Jag, T Bird, Corvette . . . \$24.75 (plus \$2.00 postage).

OCTOPUS BAGGAGE STRAP is 4 strands of tough shock cord with hook ends, secures bags instantly . . . \$2.95

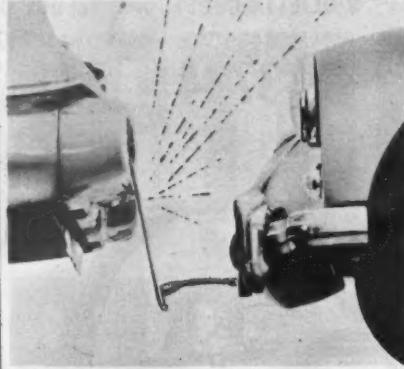
FIXE BAGGAGE is a single strand which performs largely the same function, eliminates knot tying. \$1.95



A DESMO BOOMERANG MIRROR dresses up your car and serves an eminently practical purpose: preventing traffic misuses. Its added advantage lies in the fact that it resets itself to where you want it no matter how many times or how hard it is bumped, pushed or poked. Flat or convex . . . \$4.95 (get a pair, it's even safer)



Under the general heading of car care would certainly come fire prevention . . . and the SUPER FIREMAN is a small but efficient handful of fire protection. Mounting clip is included at \$7.95
REFILLS \$1.25



Do you carry flares? Very useful in case your car or another is stalled in a dangerous situation. Keep fuses in a light aluminum clip which mounts in trunk. \$2.25

Parking, even, can be hazardous for the small car . . . drivers of larger vehicles often do not see it or have a grandiose idea of how much punishment a little bumper will take. Apply a SONIC SHIELD to the bumper and protect the grille . . . it sounds your horn when approached too closely. 2 wires to connect, simple, foolproof \$9.95

And, then there is always the original Mitten . . . excellent protection for the car which must sit out exposed to the sun, dust, grit, smog, fog, birds, and other hazards. On or off in a trice, the Mitten will repay you manyfold at trade in time. Folds into a compact bundle so you can take it with you, shock cord hem keeps it snug. Get one today.



MG Mitten
Healey Hugger
Triumph Tunic
Alfa Apron (Spyder) } \$17.95 Lightweight Canvas
\$24.50 Duralin (Water repellent not plastic)

Jaguar Jacket (XK 120)
Porsche Parka
VW Vest
Gibson Gown } \$22.95 Canvas
\$29.50 Duralin

Jaguar Jacket (140-150)
Mercedes Muff (L90-300SL)
Corvette Cap
Thunderbird Tepee } \$22.95 Canvas
\$32.50 Duralin

These are typical prices, write for others. State year, make and model when ordering. Semi-fitted canvas covers are available for all cars, ask about them.

MG MITTEN

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SHOWROOM: 3044 N. San Gabriel Blvd. 2 Blocks S. of San Bernardino Freeway

TECH

by Steve

JAGUARS AND GEARBOXES

I own a Jaguar Mark VII in which I recently knocked out the four-speed transmission. Can I replace it with either the XK-150 or 3.4 gearbox? I understand that they have better gear ratios. Would this show any improvement in acceleration or top speed?

Ray B. Johnson
Los Angeles, Calif.

Well now, you can't have your cake and eat it too, unless you buy more cake-mix. Improvements in one or the other are often achieved by gear ratio changes, (usually in the rear axle, though); the only way to get more of both is to have more power.

Changing to a closer ratio gearbox as you have suggested (see table below) will give you higher top speed in each gear but top, at the price of slightly reduced punch.

The usual purpose of a close-ratio box is to suit it to a highly tuned engine that is effective over only a rather narrow range of revs. In the case of the Mk VII and VIII and, to a certain extent, of the XK-150, we might say that a wide ratio box is used to make sure that performance in first gear will be "sparkling," yet ensure that fourth gear will give "effortless" (low revs) cruising and an impressive enough top speed.

The Jaguar gearboxes are all interchangeable. The ratios are as follows:

Gears	Marks VII, VIII	XK-150	3.4
I	3.38	3.38	2.97
II	1.98	1.86	1.74
III	1.37	1.28	1.21
IV	1.00	1.00	1.00

As you can see, the ratio in fourth is 1.00 in each case, so improvements in top speed cannot be achieved here. Instead you must change the ring and pinion gears in the rear axle. Choices here are 3.54, 3.77, 4.09, 4.27 and 4.55; you probably have the 4.27 ratio, but you can easily check by jacking up one rear wheel, turning it through exactly two revolutions and counting the number of times the driveshaft revolves.

BUICK BRAKES

From the description of the tests this certainly seems to be a significant improvement in brake performance. I wonder if you could tell me why they are not used on all four wheels. It would seem that cooling problems are at least as severe on the rear brakes as on the front ones.

W. A. Farmer

Pittsburgh, Pa.

In the case of the Buick, the weight on the front wheels is disproportionately large to begin with. When you take into account the forward load transfer due to the location of the CG above the ground, there's very little load left on the rear wheels, therefore very little braking traction available (notice how many cars lock up a rear wheel under heavy braking). So if they're not doing much braking, why should they fade? Besides, aluminum brake drums cost \$.

NOTES

Stephen F. Wilder

SMALL CAR CHOICE

I have been reading your sports car magazine for a long, long time. I need a small car for going to work. I have narrowed my choice down to two cars; the Simca and the Volvo. Do you think I should consider any others? Please advise me what to buy.

J. Williamson
Bronx, New York

Your question is one which another person cannot easily or accurately answer for you. The car which is best for one person is not necessarily the best one for another. You will obtain interesting and pertinent information on these two cars from our road tests of them. For a list of all road tests we published in 1957 see page 48 of the Jan. '58 issue. Below is a list of all road tests in SCI in 1956 since the April issue when the Ziff-Davis Publishing Co. took over SCI.

Mercedes-Benz 300SL coupe April*
Volkswagen Karmann-Ghia April*
'56 Corvette May*
Alfa Romeo Giulietta May*
Porsche 1600 Speedster June
Ford Thunderbird June
Austin-Healey June
Arnolt-Bristol July*
AC Ace August
Dodge D-500 August
Volvo September
Saab September
Mercedes-Benz 190SL September
Jaguar 2.4 October
Renault Dauphine October
Morgan Plus Four-TR3 November
Simca Aronde 1300 December*
Citroen DS19 December*

*These issues can still be obtained by sending thirty-five cents per copy to our Circulation Dept. at 64 E. Lake St., Chicago 1, Illinois.

BERKELEY BOLIDES

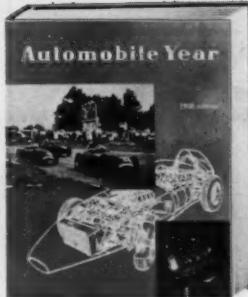
The Berkeley Sports interests me very much. I've always wanted a sports car and this one sounds very interesting and economical. I wonder if a larger engine could be installed, say a Volkswagen?

Darrell Kahl
Eugene, Oregon

I'm with you on the "interesting and economical" bit, but don't you think the jump from 328cc to 1192 puts this into the "Violent VW" category? (SCI Jan. '58)

Incidentally, to illustrate that story, we used a photograph (slightly retouched) of a VW which once belonged to another Technical Editor, just to add a little spice. Apparently he has spent more than a few hours on his drafting board trying to find out if it really was possible. We're still chuckling.

But back to your Berkeley idea; stick to motorcycle engines (for cooling and attaching to engine case) and don't go over about six or seven hundred cc, because the combined gearbox-final drive unit can't be expected to take too much.



BACK ISSUES: Rare 1954 (1st ed.) \$6.50 1957-\$9.95 SPECIAL OFFER: 1954, '57 & '58 (all 3) \$25.00

SERVICE MANUALS \$6.95 ea.

Official factory manuals for Australia are accurate, authoritative & complete. Each has many illustrations, charts, diagrams & drawings covering the following:

- ENGINE • CLUTCH • GEARBOX • REAR AXLE
- BRAKES • FRONT SUSPENSION • STEERING
- COOLING • ELECTRICAL • FUEL SYSTEM
- BODY • WHEELS & HUBS, etc.

Each * denotes a separate manual as follows:

AUSTIN ★ A 40 Devon '47-'52 ★ Somerset '52-'54
★ MORRIS MINOR Series MM & ohv Series 2
★ MG-TD ★ HILLMAN '36-'55 ★ RENAULT 750/760
FORD ★ V8 & Merc '32-'48 ★ '49-'54 ★ '55-'56
★ Consul-Zephyr '51-'56 ★ Anglia-Prefect '53-'56
★ VOLKSWAGEN Incl. 1956 New ed.

MG COMPLETE SHOP MANUAL \$10.00

This one Australian manual covers for all the MG models listed everything included in the factory manuals. No further recommendation should be needed.

TUNING & MAINTENANCE OF THE MG A \$5.00

Top British tuner Philip Smith deals only with the A and the ZA Magnette in the first book to be published on tuning these engines. Author has written many tuning books and is recognized as an authority. Tips will also work on Morris, with caution!

TUNING & MAINTENANCE OF MG's (to TF-1500) \$4.00

Same author as above book but on different MG's. M.G. WORKSHOP MANUAL (1930 to TF-1500) \$8.50

Overhaul & tune any MG from bumper to tail light.

MG TF FACTORY MANUAL \$7.50

AUSTIN HEALEY 100 Six SHOP MANUAL (Mifgr.) \$12.50

AUSTIN HEALEY 100 Four SHOP MANUAL (Mifgr.) \$12.50

CROSLEY SHOP MANUAL all models \$6.00

MORRIS MINOR Ser M & MM Shop Manual \$7.50

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BRITISH CAR REPAIR DATA

SERVICE DATA SHEETS . . .

are printed in England for independent mechanics with approval of the mfg. Each set consists of 8 1/4" x 11" pages for overhaul & maintenance of Engine; Ignition; Clutch; Gear-box; Axle; Brakes; Steering, etc. Wiring & Lube charts plus many sectioned drawings.

DATA SHEETS FOR CARS . . . PRICE \$1.50 each

Austin A-40 Devon.....	148	MG TC Midget.....	155
A-40 Somerset.....	193	TD Midget.....	192
A-40/50 ('54-'55).....	231	TF Midget.....	233
Healey 100.....	214	Magnette (ZA).....	223
Healey 100 Six.....	281	Model "A".....	261
Ford Consul-Zephyr.....	184	Morgan Plus 4.....	194
Anglia-Prefect.....	130	Morris Minor.....	167
Ang.-Pref. '53-'54.....	224	Minor ohv.....	220
Hillman Minx ('49).....	158	Rover 75 ('50-'51).....	181
Minx Mk 4 & 5.....	190	60/75 90 '54-'55.....	227
Minx '55-'56 ohv.....	247	Renault 750.....	205
Minx late '56.....	267	Riley 2 1/2 litre.....	153
Jaguar XK-120.....	185	Sunbeam Rapier.....	263
Mk 7.....	197	Sunbeam Alpine.....	235
XK-140.....	241	Triumph TR-2.....	221
2.4 litre.....	277	Triumph TR-3.....	279

COMPONENT DATA SHEETS . . . PRICE \$1.00 each

Lockheed Brakes.....	232	Borg & Beck Clutches.....	238
Laycock Overdrive.....	226	Solex AIP-2 Cars.....	234
SU Elec. Fuel Pump.....	228	SU Carburetor General.....	246
SU type H-4 Carb.....	236	Borg Warner O'drive.....	258

A complete list of data sheets on request.



For racing . . . U.S. Air Force! Nearly new 100% Nylon, 3" wide with the latest beefed-up metal bars and the really quick release. Not too pretty but safest of all. Very hard to get. Can be dyed. With swivel fittings ready to install. \$12.95

Automobile Year 1958 . . . \$9.95

Contents include:—CARS OF THE YEAR . . . Photos & technical spex of all 1957 cars plus coverage of 1958 models introduced at the London & Paris shows & in the U.S.

1957 CHAMPIONSHIP RACES in detail. Covering World Driver Championship GP's; World's Sports Car Championship races; Special report on 1957 Le Mans and other events.

1957 INTERNATIONAL RECORDS . . . 1958 SPORTING CALENDAR . . . BUGATTI . . . Name & legend . . . COACHWORK OF THE YEAR . . . in photos . . . TECHNICAL ASPECTS OF FORMULA 1 RACING . . . STILL SMALLER CARS . . . PRESENT & FUTURE OF MOTOR SPORT and many other features.

Automobile Year is the finest presentation in the world of all motoring highlights of the year. Each succeeding yearly publication outdoes its predecessor and every issue of this King-Size (9 1/2" x 12 1/2") book of 208 pages becomes a showpiece in the motor enthusiast's library.

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USED SPORTS CAR BUYERS GUIDE by John Christy. Tells you what to look for & how NOT to get stuck.

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Cars are from left to right as pictured:

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TECHNOTES

(Continued from page 13)

Many of our readers, like yourself, want more power than the manufacturer provides, but if you want to end up with a useable road machine rather than an all-out dragster you must remember this: Any automobile is a collection of compromises, and there are limits to how far a purchaser may go in modifying it in one direction only and still have a satisfactorily well-rounded car.

See both parts of Ken Miles article, "Build It Right" which concludes in this issue for some very useful thoughts on "doing it yourself."

BRAKE PEDAL FORCES

When I bought my 1949 Willys Jeep it had 15" wheels and 4-ply "Knobby" tires. I could bring it quickly to a stop with moderate pressure on the brake pedal.

Recently I put on 16" wheels (combat type, the others were drop center) and I put on 6-ply combat type tires. Now I have to put extremely heavy pressure on the foot pedal to stop the vehicle. The brakes were recently relined, wheel cylinders and master cylinder in good shape. No fluid leaks.

What can I do to the brakes to fix them so only moderate pressure is needed to stop the vehicle?

James H. Scott
El Paso, Texas

Increasing rolling radius by installing larger wheels and tires will increase pedal force requirements, but only by a small percentage. What seems to be the root of your trouble is that when your brake linings were renewed, the replacement linings were "harder" than before. Hard linings generally have better fade-resistance qualities than soft ones, but the price paid is a lower coefficient of friction which in turn means higher pedal forces to achieve any given retardation. So your solution, if you still want to do anything, is to again reline, this time specifying a softer lining.

KEEP COOL!

I will shortly move to a desert area and the feature of air conditioning will be quite a convenience if I can find a unit that is designed for or adaptable to my Austin Healey 100-6. If you have such information . . .

Charles R. Beber
Fort Baker, Calif.



Well, it had to happen some day. Try writing to the O. A. Sutton Corp., Inc., 1812 West Second St., Wichita, Kansas. They make the Vornado automobile air conditioner which is suited to "post-manufacture installation."

SPORTS-CAR ZOOM!



Coupe de Sport only \$2,499 P.O.E.
Western states, slightly higher.

FAMILY-CAR ROOM!

INTRODUCING—the brightest new performers on the '58 horizon! Now, for the first time, here's sports-car performance combined with family-style comfort.

These new Sunbeams, developed from successes in European rallies and the world-famous Mille Miglia Road Race in Italy, herald an exciting new era in American motoring.

Test-drive today the car that many internationally renowned drivers rate as their first choice for a personal car—drivers who accept no compromise of quality, yet who demand the kind of response that measures up to the best any sports car has to offer, plus room for family and luggage, too!

And in no other car in Sunbeam's price class do you get so many extras at no extra cost! To name just a few: dual carburetors, full-flow oil filter, single-unit construction of body and frame for extra safety, turbo-slotted wheel discs, race-proven brakes and transmission, foam rubber seats, comprehensive sports car instruments—including tachometer, and 2-speed electric windshield wipers.

So if you've had a yen to step up to a sports car . . . and take the whole family along . . . you'd better hustle right down to your Hillman/Sunbeam dealer's. It won't be long before there's a waiting list for these two beauties!



3-Position Convertible just \$2,649 P.O.E.
Western states, slightly higher.

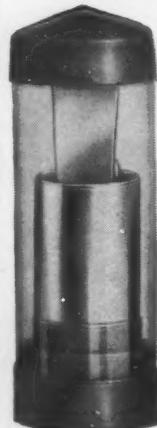
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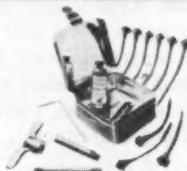
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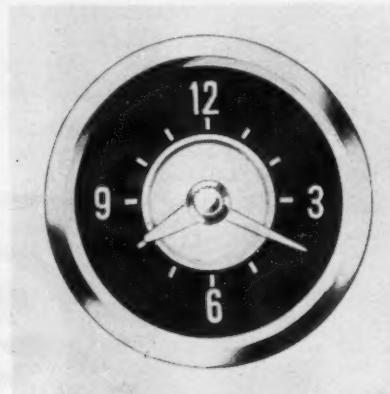
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what's new?

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Decorative and useful, this electric clock measures $2\frac{3}{8}$ " in diameter and operates on any 6-volt system. Black dial with large, easy-to-read gray numerals and hands, the clock comes complete



with installation instructions for simple mounting and wiring. This clock can be ordered from A. R. Fisher Products, 21-21 44th Dr. Long Island City, and sells for \$14.95.

EQUAL FLOW LINES

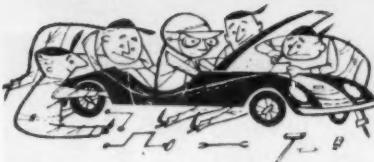
If you're the type, who likes to "watch things work," you will have a real ball with these flow lines installed in your car. Besides giving a clear picture of all the little pumps pumping, they are rust proof and can be easily installed. These poly-ethylene lines are available for MGs, Jags, TRs and Austin Heals. If interested, write to Schreiber Imports, P.O. Box 4125, Long Beach, Calif.

TRIANG-U-LINER

Designed by an engineer to quickly measure caster and camber angles of all wheels, the Trian-u-liner is a simple wheel-aligning gauge. It is of special triangular shape with a single precision



level which can give an accuracy greater than plus or minus $\frac{1}{8}$ °. The gauge is simple to use and contains no moving parts, magnets, or light beams. Triang-u-liner sells for about \$20. For further information contact Tric-kee Tool Co., Ballston Spa, New York.



ANTI HAZE

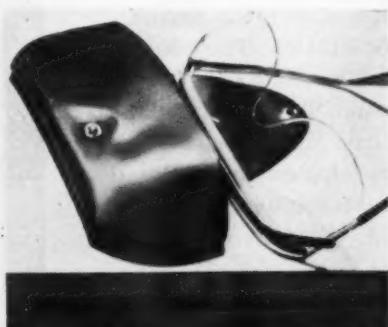
A new anti-static cleaner and polisher is reported to remove the haze and cloudiness that often develops on plastic windows. Developed by the Schwartz Chemical Co. Rez-N-Polish can also be used to clear up scratches and annoying mars on side-curtains. For further information contact the Schwartz Chemical Co., Inc., 326-328 W. 70th St., New York City.

BATTERY FOR A BEETLE

World-Wide Automobiles Corp., 49-12 Newtown Rd., Long Island City, N.Y. has available under #9915, a replacement battery for VWs at a price of approximately \$20.95. This is a 15 plate battery with a capacity of 82 ampere hours. The battery has the distinction of being an exact replacement for the original equipment found in both VW passenger cars and transporters. Further, the battery is guaranteed for 24 months from date of installation with unconditional replacement during the first six months.

FOR THE REAL SPORT

For those who drive their mounts to the races we have here a mobile pit. "Sporty" the sports car trailer will enable you to carry tools, components and other necessities to the track, doing away with the annoying loading and unloading that is so vexing to a hero driver. This trailer is designed exclusively for the sports car and can carry up to 250 lbs. of luggage. For further information, contact Adler Engineering Co., 1344 Seabright Ave., Long Beach, Calif.



HANDY GOGGLES

A very chic looking pair of plastic driving goggles is being imported from Italy. As chromed ferrules rest lightly on the ears, vision is through either a clear or a tinted plastic shield (replaceable, two supplied) that angles up from the nose. Non-shattering and non-flammable, they are marketed by Purdy Opticians, 506 Madison Ave., New York.



High Performance Cars 1958

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regular price \$2.00

FREE

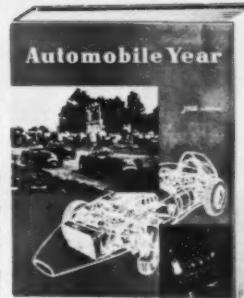
Road Tests and special features from *Autosport*, Britain's motor sporting weekly. Contents: Fangio and Moss; World Championship - 1957; Ecurie Ecosse - and Le Mans; the Motor Sporting Year; A Lotus in the Mille Miglia; High Performance Cars; Modena and Maranello; Production Car Racing; Page in the Paddock; Road Tests, by John Bolster; Aston Martin DB2-4; Rover 105S; Morgan 4/4; M. G. A. Coupe; Singer Gazelle; Formula Two; Gordini and Cooper, by Theo Page; The F2 Lotus; M. G. Record-breaker; Lotus Sports; Peugeot 403; 2.4-litre Jaguar; Facel Vega; Morris Minor with Alta Head; Austin A95; Tuning the Renault 750 and Dauphine; Gallic Grace and Anglo-Swiss; Tojeiro-Jaguar; Triumph TR3; Wolseley 1500; Lister-Jaguar; 3.4-litre Jaguar; Karmann-Ghia Volkswagen; Ford Anglia Aquaplane; Cooper-Jaguar; Anglia Elva; Tony Brooks; Historic Victory; Supercharged and Unsupercharged; Formula Three Expert; Driftmaster; Rallies; Behra in B.R.M. Regular price \$2.00

Automobile Year 1958

(Annual Automobile Review #5)

This magnificent volume, uniform in size and format with *Automobile Year* 1957 (see below) - now in its fifth year - is the finest book of its kind ever produced. For authoritative information and for pure reading enjoyment it is a must for anyone who appreciates fine automobiles. Here are some of the features: *The Cars of the Year* - A complete roundup, with photographs, of all cars produced or shown in 1957, including the 1958 models exhibited at the Paris and London motor shows as well as in the United States. All technical information is included. *Exclusive Reports on all 1957 Championship Races* - The Drivers World Championship: The Grand Prix of Argentina, Monaco, Belgium, France, Germany and Italy and the Indianapolis 500-Mile Race. The World Championship for Sports Cars: The Mil Kilometros of Buenos Aires, The Sebring Twelve Hours, the Mille Miglia, The Rennen 1000 km., The Grand Prix of Venezuela. Le Mans: A special report on the 1957 running. *International Records of 1957*. *The Sporting Calendar for 1958*. *The European Grand Touring Championship* with photographs and results. *The European Mountain Championship* - A special report by H. F. Plundner, with photographs and results. *Bugatti: a Name Which is Becoming a Legend* by R. Labria. *Coachwork of the Year*, a photographic survey. *Technical Aspects of Formula in Racing* by Paul Frere. *If Only the Roads Were White* by D. Japelli, *Still Smaller Cars* by Jacques Ickes, *The Present and Future of Motoring Sport* by G. Lurand.

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AUTOMOBILE YEAR 1957

(Annual Automobile Review #4)

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AUTOMOBILE YEAR 1956

(Annual Automobile Review #3)

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The greatest demonstration yet of how SIMCA really outperforms them all. This caper was coast to coast, New York to Los Angeles, in the new record time of 46 hours and 3 minutes. It's a record the chromium merchants have been shooting at for years. But SIMCA took the laurels on the first try.

You ask: How did this SIMCA beat them all? What could possibly be on the side of a car that costs so surprisingly little? The answer is POWER. Not brute horsepower. Not trick drive ratios. Nothing but the simplest principle of all. Just a dynamically correct balance of power, with nothing wasted.

More than anything else, SIMCA design is

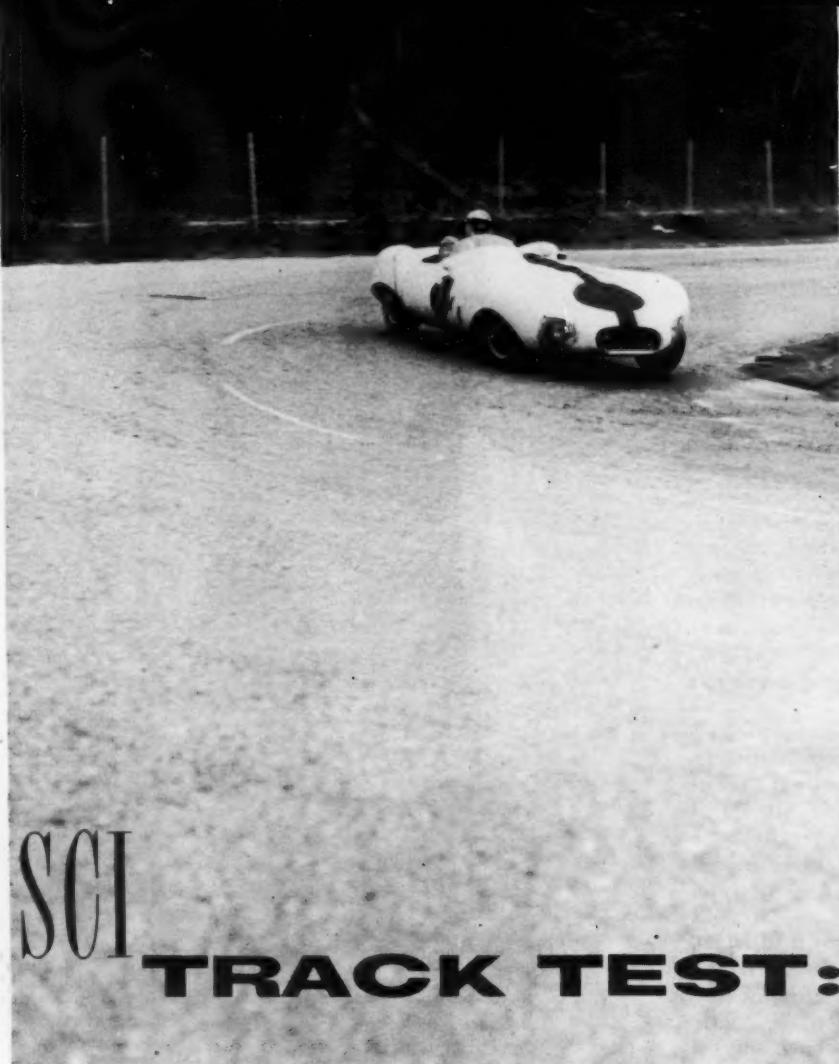
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SCI

TRACK TEST:

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V
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M
K
II

IT MAY NOT BE any good for hauling groceries, but if your idea of a sports car is four-wheeled fun (with fenders), then a racing-sports car such as the Elva Mk II may be just the thing. Elvas (from *elle va*, French for she goes) are made and designed by Frank Nichol's Elva Engineering Co. of Bexhill in England. They come in a variety of shapes and sizes. The premier model is the Appendix C-conforming Mark III at \$5600. Running it a close second, and differing only in minor details, is the \$5200 Mark II, the subject of this test. Both carry simple, aerodynamic bodies of 18 gauge aluminum with fold-open nose and tail sections. The Mk I is fitted with a fiberglass body and sports an Elva intake-over-exhaust cylinder head on the trusty Ford 1172 cc block, a Standard (Triumph) Ten sedan front suspension unit complete, and a rigid rear axle from the current Ford Anglia/Prefect. The Mark I-b is the same, but with the Climax engine.

Another Elva, one which should supplant the Mk I and I-b when it becomes available, is the Courier. Essentially a Mk I, its engine and gearbox will be BMC B-type, i.e., MGA. This should be quite a bomb for those of us in a hurry for the groceries, and its live rear axle will keep its price down. Under \$3000, it is rumored. Necessarily starker than the MG, it will still offer full amenities, which is more than can be said of the Marks II and III.

These latter two Elvas are quite straight-forwardly racing-sports cars with the accent on the first two syllables. As a matter of fact, the mufflers seem to be no more than local enlargements on the straight-through twin-exhaust pipes. Their effectiveness seems to be limited to getting past scrutineers rather than highway patrolmen, so the test Elva

*Wringing out
one of the
“economy”
sports-racing cars.*

was towed to and from the Marlboro track.

Our particular Elva is the Mk II driven by Frank Baptista to second in class G in the Governor's Trophy race at Nassau, where Elvas in general swamped their opposition. It was loaned to us by Continental Motors, Ltd., 1401 Rhode Island Ave. N.E., Washington, D. C., the American distributors.

Like most Elvas with the Coventry Climax 1100 cc engine, it is listed as Stage 2. But as individual enterprise is still well rewarded in this field, it's hard to say just how stock any particular Climax mill is after it's been in the USA for a while. The factory says 83 bhp at 6800 rpm, but some people get over 90 without straining their budget. This engine hasn't been on the dyno, so we can only guess, say at 88.

Where's Marlboro? A few years back a group of Washington, D. C. enthusiasts banded together into the Lavender Hill Mob. Not merely a social club, they have financed the construction of a tight, twisty and very fascinating road circuit twenty-odd miles SE of Washington. It incorporates about three-fourths of the old paved $\frac{1}{4}$ -mile stock car oval on the outskirts of this sleepy, tobacco-warehousing town. As well as being a weekend paradise for the locals, it has been a spirited training ground for many of the "Mobsters". It received its full seal of approval from the SCCA in 1957 when the Washington Region staged a National meet there late in the summer.

When we visited it, the air was a bit cooler, and as a passenger one couldn't help noticing the lack of a windshield. With us to drive the car in the acceleration runs was Charlie Kolb, well-known for his performances with a Mk III at Nassau and SCCA events.

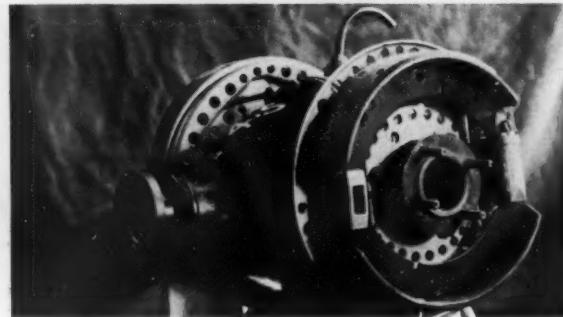
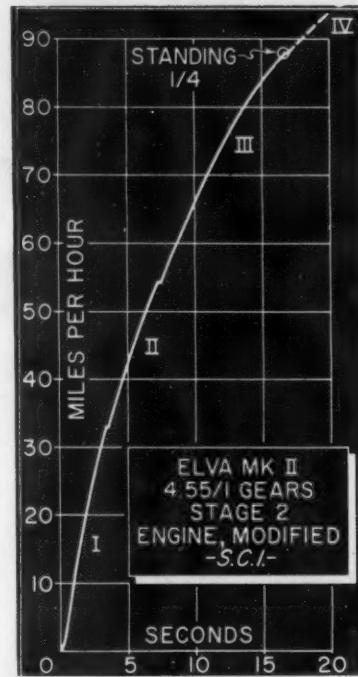
After a few warm-up laps around the oval, the tire pressures were adjusted (24 psi front and 30 rear) and we set off to run a few quarter-mile sprints. Marlboro's back straight is level, all right, but it's not quite straight for a full 1320 feet plus the necessary braking area. So all our runs were made in the usual direction of race traffic, starting just past the hairpin and running full throttle through the gentle right and left ess. We measured diagonally through this ess along the path the car would follow. The finish line was about 100 yards from the next corner, so each run incorporated maximums in acceleration, braking, and cornering!

Shifts were made very quickly, in a manner more suited to the race course than to every day use. Each start involved a yard or two of wheelspin, revs never dropping below 5000 in first gear. Shifts at 7000 rpm came up with a rush and, talk about crisp exhaust notes, this ones fairly shrieked as the tach needle spun through the $4\frac{1}{2}$ to seven thousand quadrant.

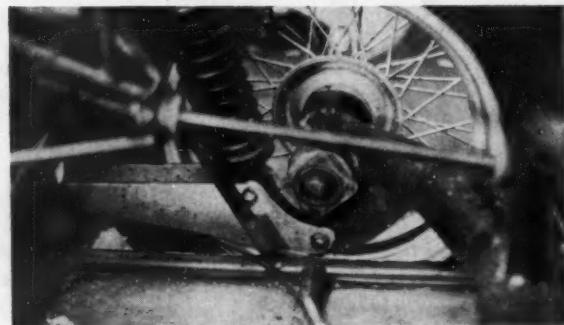
Because the car is equipped with only a tachometer, and oil pressure and water temperature gauges, we took times from a standstill to the instant when the gears were disengaged, i.e. zero to first shift, zero to second shift, and zero to the third shift. This last shift into fourth consistently occurred as we crossed our finish line, giving us the speed at the end of the quarter as well as elapsed time.

Gear ratios and rolling radius were known, so it was an

(Continued on page 54)



BMC-based rear mounts TR-2 drum brakes, unsprung.



Above, the outboard-mounted, spring carrying lower trailing arms and the simple, upper radius rods together with unshown vertical guide locate the de Dion precisely, permitting Charlie Kolb, left, to power-slide the Mk II around Marlboro's sharpest hairpin with smoothness and ease.



With four 1sts, two 2nds, four 3rds, and two 4ths, the Elva contingent at Nassau fairly swept the 1100 class. Our test car is in the middle, Frank Baptista at helm.

ELVA MARK II ROADSTER

Price \$5200
 Distributor Continental Motors, Ltd.
 1401 Rhode Island Ave., N.E.
 Washington, D. C.

PERFORMANCE

TOP SPEED:

Estimated 130 mph

ACCELERATION:

From zero to	Seconds
30 mph	3.0
40 mph	4.7
50 mph	6.4
60 mph	8.7
70 mph	10.9
80 mph	13.7
90 mph	17.9
Standing $\frac{1}{4}$ mile	16.7
Speed at end of quarter	88 mph

SPECIFICATIONS:

POWER UNIT:

Stage 2 Coventry Climax	water cooled in-line four
Valve Arrangement	Inclined, in-line, sohc
Bore & Stroke	2.85 x 2.025 in (72.4 x 56.6mm)
Stroke/Bore Ratio	0.92/1
Displacement	66.9 cu in (1098cc)
Compression Ratio	9.8/1
Carburetion by	twin S.U.
Max. Power	83 bhp @ 6800 rpm
Max. Torque	74.5 lb-ft @ 4400 rpm

DRIVE TRAIN:

Transmission ratios	
I	3.62 (2.29 optional)
II	2.21 (1.75 optional)
III	1.37 (1.25, 1.17 optional)
IV	1.00
Final drive ratio (test car)	4.55
Other available final drive ratio	3.89, 4.22, 4.89, 5.12, 5.38
Axle torque taken by	differential casing

CHASSIS:

Frame	Tubular space frame with stressed undertray
Wheelbase	85½ in
Tread, front and rear	48 in
Suspension, front	Triumph TR-3 wishbones with Armstrong coil-shocks
Suspension, rear	de Dion with Armstrong coil-shocks, 4 radius rods
Shock absorbers	Tubular hydraulic, enclosed in coil springs
Steering type	Morris Minor rack and pinion
Steering wheel turns L to L	1½ turns
Brake type	Triumph TR-3 with Wellworthy Alfin drums
Brake lining area	175 sq in
Tire size	4.50 x 15 (5.25 x 15 optional rear)
Fuel capacity	7.5 U. S. gallons

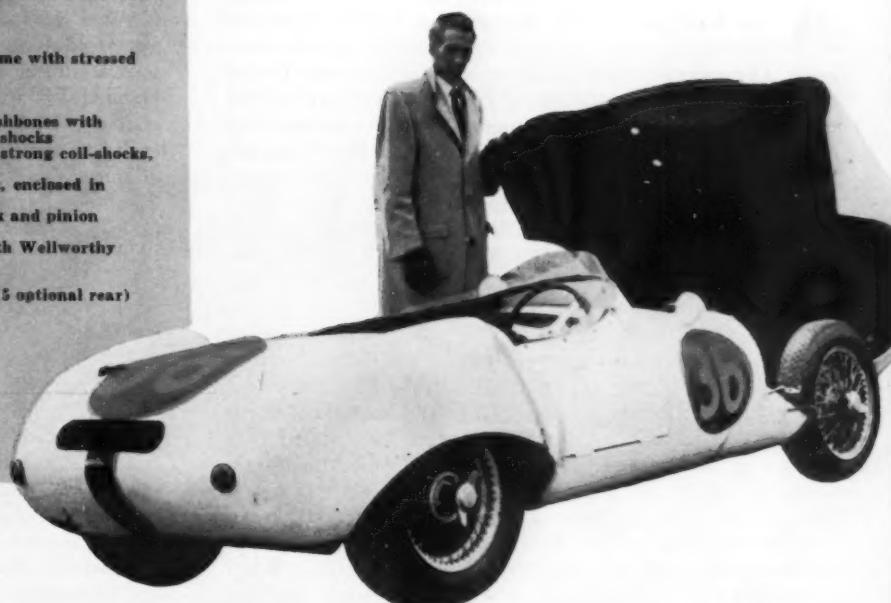
RATING FACTORS:

Bhp per cu in	1.24
Bhp per sq in piston area	3.26
Torque (lb-ft per cu in)	1.11
Piston speed @ 60 mph	1525 fpm
Piston speed @ max power	2980 fpm

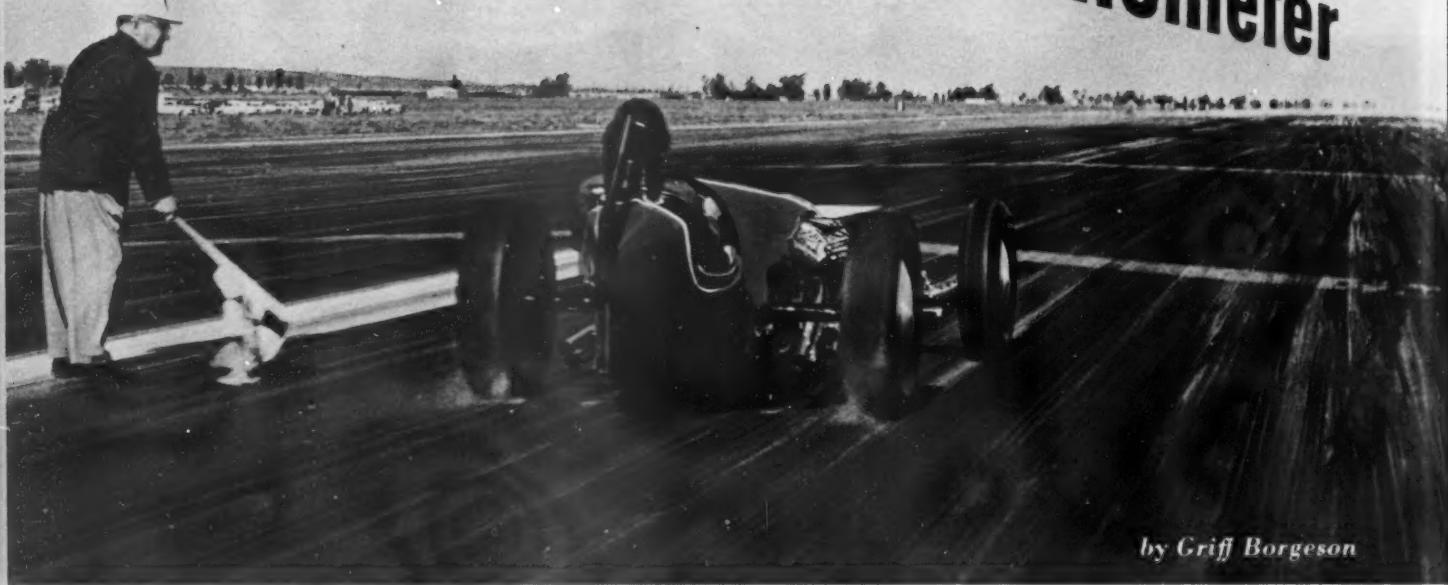
Charlie Kolb lifts lid to give us a look. The tail section swings open similarly, giving unlimited access to mechanical components.



Factory rating of stage 2 Coventry Climax engine is 83 hp but in talented hands this can be raised readily to about 88.



the fastest kilometer



by Griff Borgeson

American dragsters, running under FIA sanction, shatter Auto Union World Record, International and U. S. Records in Classes B and C.

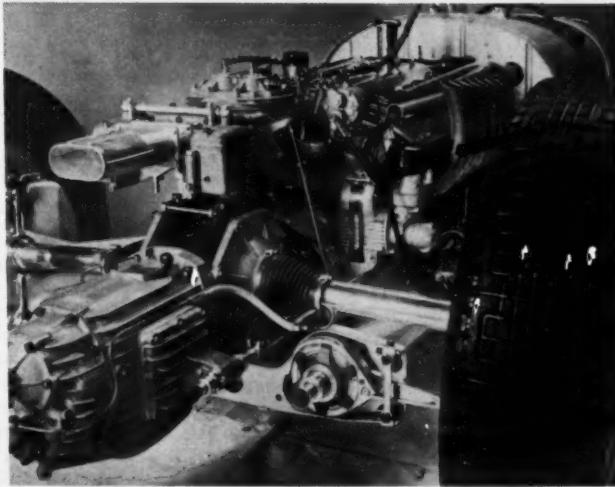
FTER THE LAST Grand Prix race of the 1937 season the Nazi government sponsored a festival of record breaking on the two-lane Frankfurt-Darmstadt autobahn. The speeds clocked by Mercedes-Benz and Auto Union on this 25 foot wide-ribbon of concrete that was neither straight, level nor smooth are incredible to Americans who think of a high speed record course in terms of broad beaches and the spacious beds of dry lakes. It was on that narrow public road that Rudolf Caracciola hurled his streamlined Mercedes to an International Class B (305 to 488 cu. in.) flying kilometer record of 268.9 mph. And it was there that young Bernd Rosemeyer, one of the only real masters of the tricky, treacherous Auto Unions, set the World Record (meaning fastest ever for the distance, regardless of engine size), and the Class B record for standing start acceleration over the kilometer on Oct. 26, 1937.

That mark stood in the FIA's *Liste Générale des Records en Automobile* for 20 years and experts have stated that Rosemeyer's average of 117.3 mph for the kilo — meaning a speed of nearly 180 mph at the end of 3280 ft. — would never, could never be broken. But, subject to FIA confirmation, it was broken on Feb. 2, 1958 by 27 year-old Calvin Rice of Santa Ana, Calif. In a smaller-engined Auto Union Rosemeyer also had set the Class C (183 to 305 cu. ins.) standing kilo record at 105.5 mph average. That record also fell last February, soundly broken by 22 year-old Ed Cortopassi of

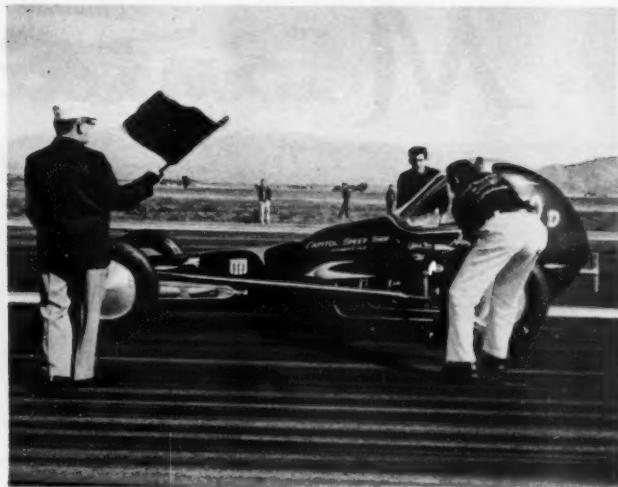
Sacramento, Calif.

What is a record? There are records certified by persons of good-to-dubious integrity using measuring apparatus of similar accuracy. Some of these — quite a few in fact — are claimed as "world records," and they conflict with other claims. To eliminate this kind of conflict all major sports each recognize an ultimate controlling body and in the case of automotive sport it is the *Fédération Internationale de l'Automobile*, whose U.S. affiliate is USAC. Heading the list of World Records on page one of the FIA book are the six held by John Cobb, the fastest of which is the flying mile at a two-way average of 394.2 mph. Now, on page one of the next edition of the *Liste*, the first listing after Cobb will be Cal Rice's World Record for acceleration over the kilo: 123.56 mph average speed. His car of course was a dragster, a very special type of American special.

The Auto Union that set the old standing kilo record and that still holds it for the standing mile was special too: It was not the standard Type C road racing model. It was the fully streamlined Stuck's hillclimb open-wheel job powered by two engines that could be swapped depending on. But of course it was far from being a "special" in the one-off and usually low-budget sense. Behind it were the financial and technological resources of a large automotive manufacturing combine, the financial and moral support of the government then in power, and the talents of such engineers



This is the sort of machinery that held the records broken by Rice and Cortopassi: Six liters, blown; 647 lbs.-ft. torque.



Down goes the flag! Split seconds later Cortopassi and Glass Slipper blasted through the trap to take C record at 116.43.

as Porsche and Eberan. It is to the Auto Union builders' credit that what they did, they did first. It is to the Americans' credit that what they did was a bootstrap operation.

With the rapid development of streamlined record machines and dragsters in the U.S. in the early 1950's the time came when American specials had the potential of setting new international records, meaning FIA records. I had the privilege in 1952 of being instrumental in organizing the first such attempt, in which the Hill-Davis streamliner clocked a two-way 229.774 mph, to break the International

Class C Record which Rosemeyer also had set during that busy speed week back in '37. The Hill-Davis team made a stab at the acceleration records but fell far short: tires, traction, gearing and power that were adequate to a record-breaking flying start on salt were not that when the start was from standstill.

It was in drag racing circles that the serious threat to Auto Union began to grow. In 1953 writer Roger Huntington slide-ruled his way to the published conclusion that the better dragsters of the day could trim the old Type C Auto

(Continued on page 48)

Rice storms through the final light at better than 180 miles an hour during one of the runs. Average over kilo was 123.56.



Mountain Madness

Trophies were secondary; the trick was to finish



Author and co-driver, Doug Kennedy, beside badly dented but roadworthy TR3



Scenic roads by day, hazardous at night when snow covered.

"NOW what am I supposed to do?" "Get the hell off of my head and let's try to turn the car right-side up!"

A few minutes before, I thought we'd had it when we bounced off an ice-covered snow bank, flipped the car over, and sped on upside down, like a bobsled. Though it wasn't the end it was surely the climax of our trip from Paris to Monte Carlo in car #305.

It all started when Doug Kennedy and I decided that we wanted more than just the American navigational challenge rallies. These were not hairy enough for us. With our superior navigation and our great skill as drivers, we were going over to show them. *Sure* we were.

When we learned that we were to be the only Americans competing, the responsibility of defending the blue and white lay heavy and we made the most careful preparations possible. We selected a new TR 3, and as it turned out this was the wisest choice we could have made. It is a rugged car that can be flogged, yet it will continue as though nothing happened. In our class we were driving against Porsches and Volvos, and the Triumph survived them both. It was of great help that the factory was behind us and the car was specially prepared for the rally. Nor was it the factory's fault that out of seven specially-prepared TR 3s only Gastonides' finished, and he was side-swiped by a snow plow, arriving at the last checkpoint with what looked like half a car. Triumph still took first and third in its class.

The Monte Carlo Rally has a reputation as one of the softer competitions as far as European rallies go, and the outcome is usually decided by gimmicky tests after the road run is finished. This year, the officials decided to make it different. The starting points remained unchanged; Athens, Lisbon, Oslo, Rome, The Hague, Glasgow, Munich and Paris. The routes were planned so that all were about 2,000 miles, or about 49 hours drive to Monaco. After a rest of 6 hours or so at Monte Carlo, there would be another 600 miles (or about 17 hours) of a high speed regularity run on the so-called mountain circuit. Fifty-nine cars out of the 342 starters finished the first road course: out of these, only 21 survived the mountain circuit. Naturally, not to embarrass any of our friends who were in the majority, neither did we.

Now, to show what kind of a run this



Monte Carlo 1958

By Robert Halmi

was, and give all sorts of excuses why we let our colors down: we arrived in Paris and checked into the Mercedes Hotel, which was completely taken over by the Triumph drivers among whom were John Waddington, the British rally champion; Paddy Hopkirk, the Irish rally champion; Gastonides, the Monte Carlo champion; and Tiny Lewis, one of the best rally and racing drivers in England. We soon became friendly with the rest of the team, and we spent most of the time in rally talk.

The start from the center of Paris was done in the complete French manner. Champagne was doled out to everyone, and a minute before the start a surprise package was put into each car—a bottle of cognac, presumably for 'happy motoring.' We took a last minute check of our equipment, and set our Halda at 78 kph. Since we had to maintain between 60 kph and 80 kph, we knew we had to maintain a high average speed to reach Monte Carlo unpenalized. Between Paris and Monte Carlo, there would be 15 check points, and in order to shave extra time, we decided on the 78 kph Halda average. This is roughly 47 mph. Averaging this speed through Paris would be difficult at any time, but this was the rush hour and the pedestrians had the great advantage. After the first few numbered cars sped through the Paris streets, the Parisians got into the swing of things. The gendarmes at the intersections stopped all traffic and waved us through, while crowds on the sidewalks shouted words of encouragement. Doug and I were sure we heard the strains of the Marseillaise in the background. All in all, when we reached the outskirts of Paris, we were in high spirits but 14 minutes late. To get back on time I had to test the TR's speed. I got it up to 150 kph (about 100 mph), and held it there until the Halda reading co-ordinated.

It was quite a thrill going through the little French towns. All the gendarmes and villagers lined the road screaming at us to go faster. We sped by quite a few drivers who chose to drive at a lower average speed, and Doug and I smugly exchanged understanding smiles.

Without any exciting incidents, we arrived at our first check point, Chaumont, with enough time for a quick dinner, a glass of wine and a dixidrine. As they stamped our road book, the officials gave a mild warning that the fun was just about to begin. The weather reports were not favorable and the condition of the roads

(Continued on page 56)



Unrecognizable, this is a Monte Carlo Rallye-equipped Rover.

Whenever possible, local gendarmes gave the Go sign.



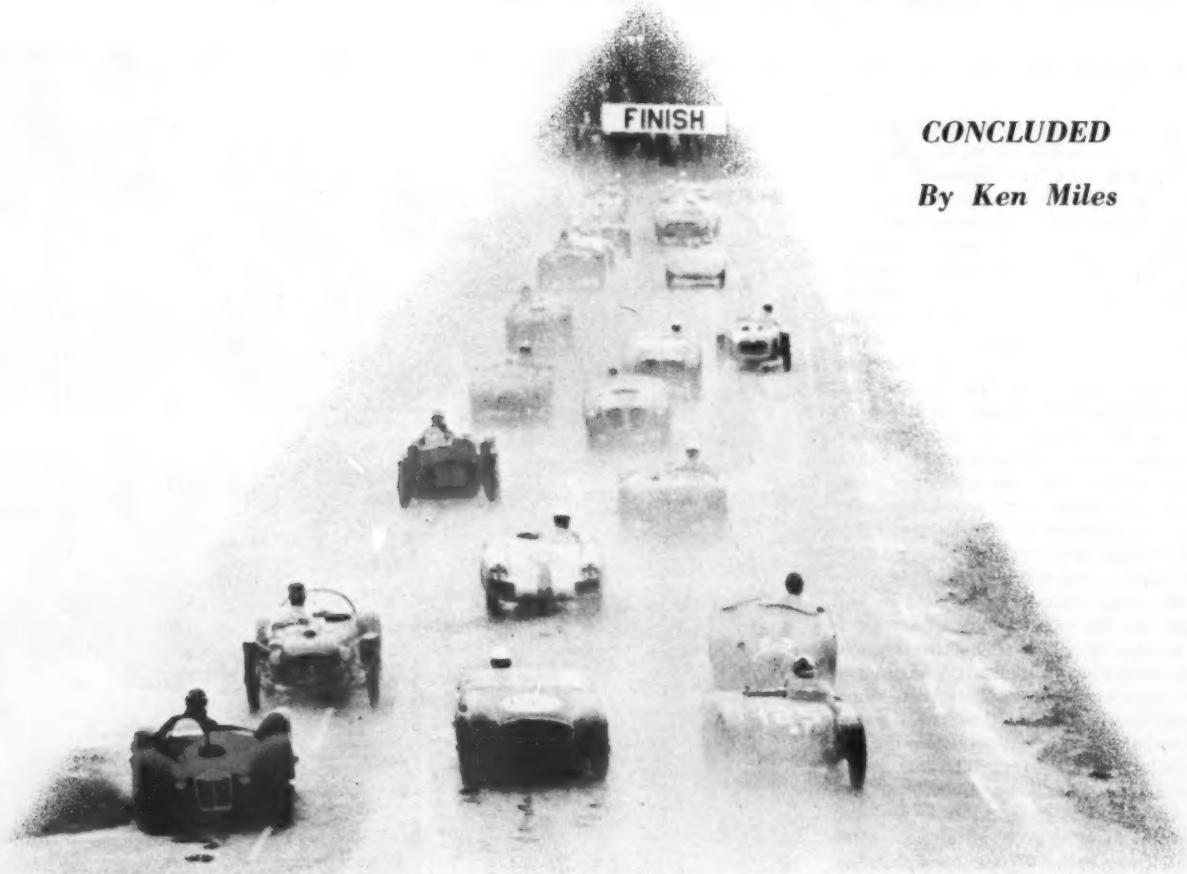
Tight turns with steep drop offs made for careful driving even in daylight.

Roads were lined by disabled cars, like this DS19, that didn't make a bend.



342 starters; 59 finishers; of these, an additional 38 were knocked out by the treacherous Mountain Circuit.





CONCLUDED

By Ken Miles

BUILD IT RIGHT

At Pebble Beach, 1955, both Miles specials were seen together in one race.

BEFORE WE ATTEMPT to lay out the final chassis design, we should consider what type of suspension we are going to use, and what springing medium, some types of spring being more easily adaptable to some types of chassis than others. A discussion on the relative merits of various types of suspension, or different applications of the same basic design could easily fill a whole book, let alone a short article. Even the relatively simple question of type of spring, leaf, torsion bar, coil spring or air suspension can spark the most tremendous argument amongst design experts. It is generally agreed that some form of independent front suspension is needed to cope with the large wheel movements that are considered necessary. The important thing is that the front suspension shall be properly coordinated with the rear.

No such agreement exists with regard to the rear suspension, and there is a wide divergence of opinion even amongst manufacturers of essentially similar vehicles. Some experts consider that the simplicity of the "live" axle and the ease with which it can be fitted into the general design

more than outweigh its disadvantages in terms of unsprung weight, particularly on a small car, where the weight of the axle and brakes can be kept very low. Briefly, the disadvantages of the "live" axle are the high unsprung weight, since the final drive unit is bounding up and down with the wheels, and the effect of engine torque in tending to lift the right-side wheel from the ground, though this is mitigated to some degree by the use of a limited-slip differential. Both these disadvantages can be overcome by the use of a de Dion type rear end, where the final drive assembly is mounted solidly on the chassis frame and through universally jointed shafts, drives the wheels which are connected to each other by a light, tubular axle (de Dion tube), as well as fully independent rear suspensions in which there is no rear axle beam at all, the wheels being carried independently as at the front, or by the use of a swing axle. All these systems have the disadvantage of greater complication and possibly greater overall weight, due to the multiplicity of highly stressed universal joints and the necessity for providing a chassis mounting for the final drive assembly. It is

also quite possible to end up with a system incorporating the failings of both types of suspension, as Ferrari did in some models, when the de Dion rear end had the brakes mounted outboard with the wheels and the complete assembly had an unsprung weight not far short of that of a live axle, an overall weight considerably in excess of the live axle weight and a notorious wheel lifting tendency, so that a reversion on later models to a "live" axle was no surprise at all. On the other hand, the de Dion installation in Colin Chapman's Lotus is a beautiful piece of work, being light, simple and efficient, and it is difficult to see how a "live" axle could do the job so well with any saving in weight. When it comes to buying a Lotus though, the de Dion makes about a \$1000 difference in price.

The nicest thing you can say about the swing axle is that it is extremely simple, whilst the low pivot swing axle does not even enjoy this good feature. In some cases the use of some form of swing axle is inevitable, particularly when a combined gearbox-final drive-engine assembly makes the use of a de Dion tube impossible.

As far as the suspension medium itself is concerned, with all due respect to my friend John Cooper, about the only unacceptable form of spring is the leaf spring, and this be-

cause the internal friction of a leaf spring is both undesirable and unpredictable. (Ed. Note: Cooper's F-1 and F-2 for '58 have abandoned the front leafspring.) The only possible excuse for the use of a leaf spring is that it forms an excellent location member by itself and can be used to take the place of A-frames or radius rods, thus simplifying the task of the designer and reducing the complexity of the suspension system. Many words have been spoken and written about the relative merits of the torsion bar and the coil spring, but as far as I can see the deciding factor would be the ease with which either could be worked into the design and the relative availability. The coil spring is, after all, just a torsion bar wound into a cylindrical form. I rather tend to favor the coil spring wound round the shock absorber, since this arrangement necessitates only one attachment point to the A-frame and one to the chassis frame.

Whilst there is a shortage of good power plants, fortunately no such shortage exists in the gearbox and rear end department. For a small car I would tend to favor the Porsche gearbox and final drive assembly chiefly because of its lightness and the almost infinite variety of ratios available, but in lieu of this unit I would make a deal with Lotus for one of their centre sections. If Elva can buy them, so can

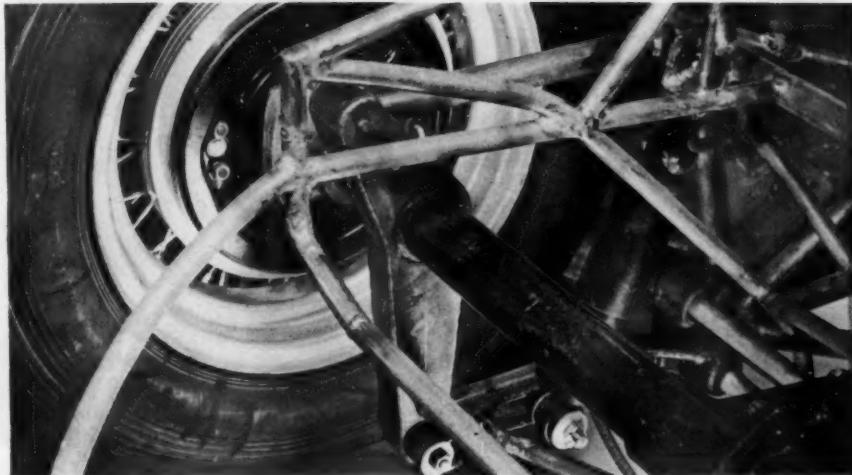


Left, George Beavis' Offy used De Soto 2LS brakes with new backing plates to really get air in and out.

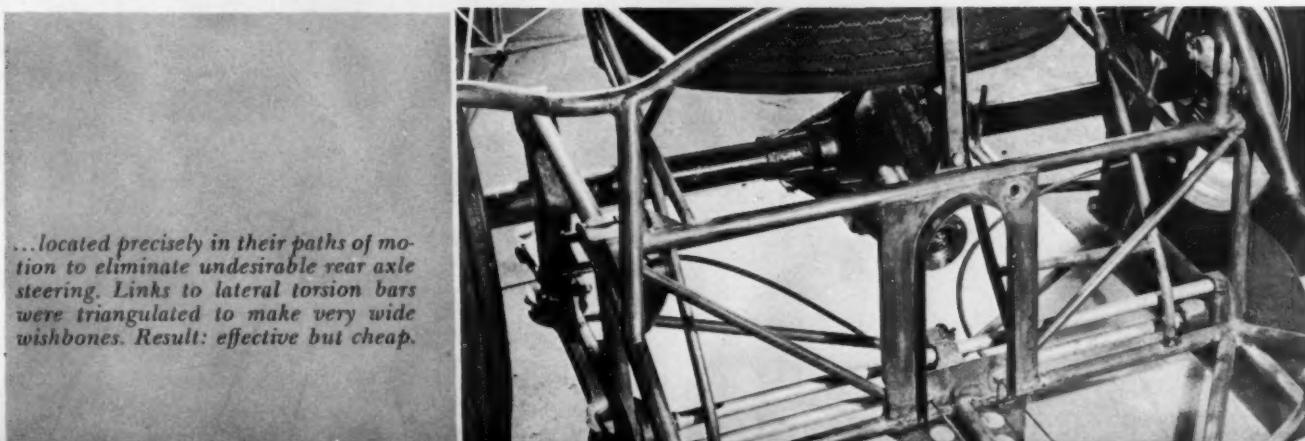
Right, Barlow drilled and drilled Simca brakes.



(Continued on page 44)



Although the author plumps strongly for de Dion rear axle layouts, both his MG specials used rigid rear axles of mixed Morris, MG derivation. In both cases he was careful to see they were...



...located precisely in their paths of motion to eliminate undesirable rear axle steering. Links to lateral torsion bars were triangulated to make very wide wishbones. Result: effective but cheap.

MAY '58

SPORTS CARS ILLUSTRATED

Charlie Lucky



and the Grand Prix

Pignatelli

by Robert G. Lurie

YOU want me to drive your Porsche? I'll drive it. But get it tuned someplace else. I'll meet you in the paddock on practice day. We don't tune sports cars any more. We don't even pump gas for sports cars. So don't come around. It's just a regular gas station now. So stay away, hear? I'll meet you up there. Or get another driver.

I just can't afford any sport cars around my gas station — not even a VW — not even a Ford with seat belts. It's a long story. But keep it quiet. Or maybe you'll need another driver because I'll be sick. Very sick. From getting leaned on with a small, hard baseball bat.

It all started when I won Class D Production a year ago. Some of the Right People — the gentlemen drivers — didn't like a gas station boy being a winner in the National Championships — but they didn't say anything — just didn't invite me to lunch at Chanterusse. And I was too busy to have hurt feelings anyway. And a lot of other guys got a charge out of Joe Provone winning, you know, with no trailer trucks, or red nylon coveralls for the girls, or cocktail parties.

One Sunday I'm at Danville and my old man comes up for race day, like always, but this time he's brought a friend. It's Dino Partelli — the big man in Queens. You know — he's got the Teamsters local, and all the big Books. But he's really a gentle guy — he grew up with the old man in Palermo, in the old country, and he likes cars and racing. He bought his boy at college a Jag. Anyway, there he was, grey silk suit and all, wishing me luck at the start of the race. I was first in class — even though the shocks were bad.

When I pull in, Big Dino is waiting, and with him is Charlie Morrison. He had his big truck trailer, complete with machine shop, with four Maseratis entered in the big race. I think Schaeffer and Daniels were driving for him that season. I don't think Morrison ever even looked at me before, but this time he managed to squeeze out a sickly grin when Dino came over to congratulate me. And when I see a large roll of bills in Dino's hand, I know that Morrison is slightly ill because he found somebody who took one of his large casual bets. And who collected. I guess he didn't usually find people at sports car races who could cover two grand with what was in their right hand pants pockets.

Dino says simply, but with great pleasure, "You drive good, kid." And Morrison says, "Yes, maybe by next season you'll be ready for the big cars. Give me a call in Hollywood this winter, and perhaps we can find a seat for you." I told him politely that I drive my own cars. I've got to work for a living, you know. Dino sees the set-up and sets out to needle Charlie a little more, which is not too difficult considering he is already needled some \$2000 worth already.

"Why not give him a Maserati now, Morry," he says. "You know, for sport. I'll back him."

Morrison puts on the wealthy sportsman face and explains that in his opinion I'm not quite ready to drive his machinery. "A bit more fragile — and tricky — than Bristols, y' know." Dino scowls and mutters a bit, then gets into his sky blue Caddie — the one with air conditioning — and tears off. I get busy changing to colder plugs so Morrison can walk away without stepping on my face. Which he does. Walk away, I mean.

I figured that was the end of it, but comes Monday morning my second customer out at the pumps is big Dino himself. He's driving the cream Caddie this morning — the convertible. In two minutes he's got me sitting back in the shop pouring my heart out about driving really hot machinery and how I could lick Morrison's stable — and maybe the other big shots too, with a little luck and the right car. I don't know why I went on so, but I told you this guy is a politician — didn't he make monkeys of the senators on TV last year?

"So it's easy, kid. We buy you a Maserati. The latest, The best. And you win. The day you win I go to the race and

(Continued on page 62)



Illustrations Stan Mott



SCI ROAD TEST:

CHANCES ARE, if you own a Saab 93B, you're the kind of person who goes places and does things. It's that kind of car. The B model is very much like former models, most of the changes being by way of appointments; but each new feature is a valuable addition to an already very functional machine.

Let's suppose you go to a place where accommodations are unavailable, making it necessary to sleep in the car. A kit is available that allows you to shift the seats and set up a bed, suitable for two (or three, crowded). The cost: \$7.50. If, at the same time, you need large stowage space, the seats can be either shifted or removed, providing storage area extending from the trunk lid to the rear of the front seats.

This is the part we appreciated most. When we decided to road test the Saab 93B, we realized that performance figures tell half the story; the other half is possibly more important — how well does the car do the job for which it is intended, and can you have fun doing it? With this in mind, we took our Saab on a ski trip. Since only two were to be aboard, we removed the rear seat completely and left it at home. There was room for seven foot skis to rattle inside the trunk, and plenty more for boots, sweaters, parkas, and the remaining poundage and bulkage that invariably accompanies such an expedition.

Once on the Thruway, we got to love the Saab. Designed by aircraft engineers for transporting passengers comfortably in very cold Sweden, the cockpit is so air-tight that the heater doesn't function properly unless a window is opened to allow some of the pressure to bleed off. In addition, the engine is thermostated at 180°; however, in really cold weather, a chain inside the cockpit pulls a screen over the air intake, cutting off the cold air to the engine compartment and helping to raise the temperature to 200°. The air that comes from this heater smacks of a blast furnace.

No matter how fast we went, there was no wind noise. Before the body design was finalized for production, a prototype was wind tunnel tested. This consideration for aerodynamics is appreciated in direct proportion to the speed; at the top end, there is no noticeable wind resistance or drag. Tracking, even in severe cross wind, is excellent.

The engine is a remarkably responsive and quiet power-plant, possibly because it's balanced both statically and dynamically, and damped for torsional vibration. Over-revving is impossible; the manual states: "Under favorable conditions, such as slight down-gradients or following winds, the endurance of the engine can be utilized to drive at speeds considerably in excess of the car's maximum level-ground, still-air speed without danger of damage to the engine." In other words, just stand on it, boys — you can't hurt it.

Though the two-stroke engine could well be noisy, exhaust flows through two silencers that maintain a far from offensive noise level. The gear box is a three-speed unit controlled from a conventional-pattern steering-post shift. A free-wheeling pawl allows shifting without clutching, as long as the car is in motion. Foot pedals are conventional, placed slightly to the right of the driver's feet. The emergency brake is placed between the bucket seats, where it can be reached when turning in a close arc. Cutting the wheels, applying power, and engaging the hand brake, locks up the rear wheels and allows the front end to pivot around them, cutting the Saab's turning radius to something like seventeen feet. We had no difficulty U-turning on double-lane concrete roads.

The foot brake pedal requires considerable pressure to stop from any speed, probably because the linings are hard; but the necessity for this added pressure is more than compensated for by the efficiency of the brakes. On our brake-fade test — ten successive crash stops from 50 mph — we registered approximately $\frac{2}{3}$ g on each stop, and neither pedal pressure nor pedal travel were noticeably increased. The brakes did not deteriorate.

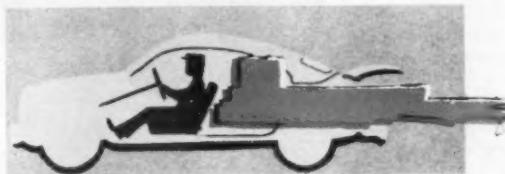
(Continued on page 52)

Aerodynamics are excellent; prototype body was wind tunnel tested. Fast turns come flat and easy, as power applied to the front wheels pull the rear around.





Rear seats can be pivoted up or removed, providing cavernous trunk space. Seven-foot skis slide in easily. Optional bed kit transforms the Saab to a sleeper car.



Front bucket seats give lateral support; rear seats have three-way adjustment, are "full-time" seats. Safety belts come over shoulder; released, never contact floor.



SAAB 93b

Price \$1895
Distributor SAAB Motors, Inc.
405 Park Ave.
New York 22, N. Y.

PERFORMANCE

TOP SPEED:
Two-way average 70 mph

ACCELERATION:

From zero to	Seconds
30 mph	6.2
40 mph	11.5
50 mph	18.7
60 mph	28.5
Standing $\frac{1}{4}$ mile	23.7
Speed at end of quarter	55 mph

SPEEDOMETER CORRECTION:

Indicated	Actual
30	26
40	36
50	45
60	55
70	64

FUEL CONSUMPTION:

High-speed driving (over 60 mph) 27.5 mpg
Oil consumption 1 qt per 300 mi

BRAKING EFFICIENCY:

10 successive emergency stops from 50 mph, just short of locking wheels. Registered approximately $\frac{3}{5}$ g on all stops. No additional pedal travel or pressure was noticeable.

SPECIFICATIONS

POWER UNIT:

Type	3 cylinder, water-cooled
Valve Arrangement	None; two-stroke ports
Bore & Stroke	2.59 x 2.87 in (66 x 72.9mm)
Bore/Stroke Ratio	0.91/1
Displacement	46 cu in (748cc)
Compression Ratio	7.8/1
Carburetion by	One down draft Solex 40A1
Max. Power	38 bhp @ 5000 rpm
Max. Torque	52 lb-ft @ 2000 rpm

DRIVE TRAIN:

Transmission ratios	
I	3.31
II	1.54
III	1.00
Final drive ratio	5.2
Axle torque taken by	Transverse links

CHASSIS:

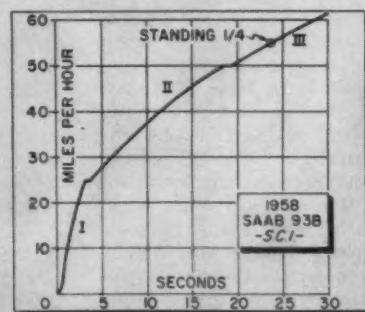
Wheelbase	98 in
Tread, front and rear	48 in
Suspension, front	Coil springs, transverse links, Stabilizer bar
Suspension, rear	Coil springs, U-shaped center-pivot axle
Shock absorbers	Telescopic
Steering type	Rack and pinion
Steering wheel turns	2 1/4 L to L; 14/1 ratio
Turning diameter	18 ft (or less)
Brake type	Hydraulic
Brake lining area	90 sq ins
Tire size	5.50 x 15
Rim width (outside)	4 ins

GENERAL:

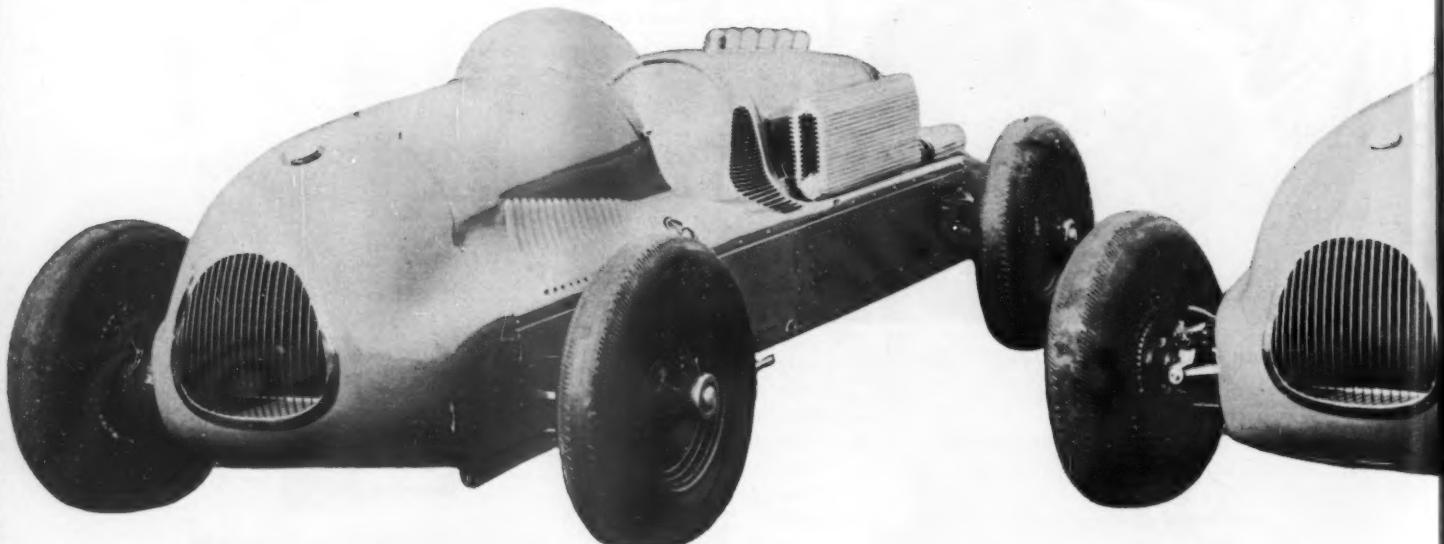
Length	157 ins
Width	61 ins
Height	57 ins
Weight, test car	1760 lb
Weight distribution, F/R, with driver	59/41
Fuel capacity	9 1/2 U. S. gallons

RATING FACTORS:

Bhp per cu. in	0.83
Bhp per sq. in piston area	1.55
Torque (lb-ft per cu in)	1.3
Pounds per bhp-test car	46.3
Piston speed @ max bhp	2400 fpm
Brake lining area per ton (test car)	132 sq in



HARRY MILLER'S



CARS FROM

Twenty years ahead of its day, the Gulf Miller was the hard luck car of all time.

By Griff Borgeson

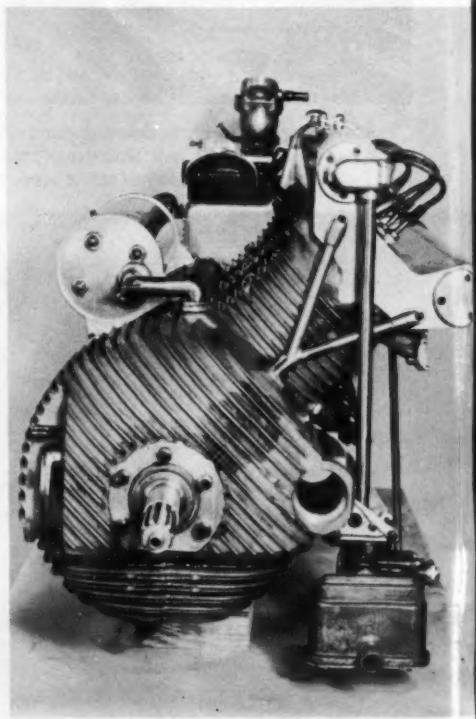
WHEN HARRY MILLER, one of the greatest race car engineers in history, went bankrupt in 1933 he left Los Angeles never to return. The Miller tradition and some of the firm's physical assets were salvaged by the quixotic Old Man's Sancho, hard-working and level-headed Fred Offenhauser. The erratic genius himself pushed east, in search of new fortunes and outlets for the torrent of ideas that poured from his restless mind.

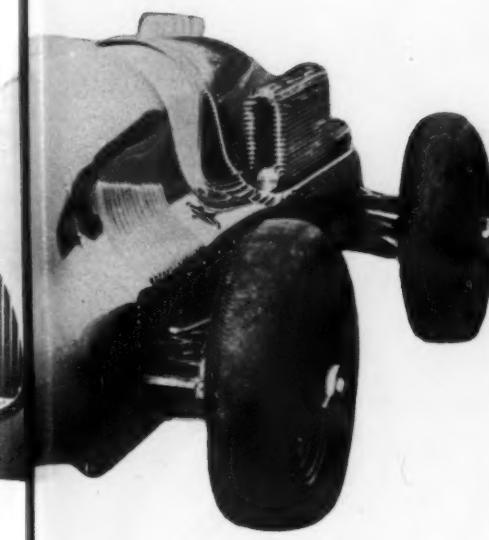
Miller found the help he looked for because his fame was deservedly great, but he never found real success in the east. Everything he built turned to dust and his most brilliant conceptions were dogged by luck that was heartbreaking enough to kill a strong man. Part of his bad luck had a rational explanation. A famous engineering contemporary of Miller's says, "A combination of many talents was the key to Harry's success. He was not able to bring a job to completion by himself. He had plenty of ideas that sounded good on the surface but were unsound. The old boys, Offenhauser and Leo Goossen, weren't afraid to pound the drawing board and say 'Dammit, Harry, it just won't work.' The new men he worked with back east didn't have that judgment nor that insight into his character. They were awed by Miller's great reputation and they just yessed him."

But this was not the case when Harry sang his swan song to the tune of the FIA formula that went into effect in 1938 and which still survives in essence at Indianapolis. This time he sold his conception—perhaps the most brilliant one of his life—to the Gulf Research & Development Co., a division of Gulf Oil. This time he had really big money and superb production facilities to work with, and he had the collaboration of highly trained engineers, diploma engineers, to screen his intuitions. The cars that resulted from this collaboration were fantastically advanced for their day. That they sparkled with originality and novelty no doubt had something to do with their troubles, but only with the small troubles. Miller, a confirmed mystic, would have been the first to point out that Fate, long his persecutor, really had it in for him.

The new international formula limited piston displacement to 274 cubic inches (4.5 liters) or 183 inches (3 liters) supercharged. It left fuel up to the user's option. Gulf R&D became interested in the possibility of a racing-car program that would demonstrate the quality of Gulf automotive products (the "laboratory-on-wheels" cliché had not been invented). In other words, Gulf was ready to go racing if the machine were available that could perform excellently using the company's then 80-octane No-Nox gasoline and Gulf-pride oil. Miller convinced his new patron

Despite 45° tilt, crankcase is split on horizontal plane, well below center line of shaft. Head is integral with block.





MARS

that he had the package that could do just that. Except for his choice of engine location, anticipated by Dr. Porsche, it was pure Miller and it was so far ahead of its time that its design still is prophetic, 20 years later.

Remember the fuss that was caused in the early 1950's when some U.S. race car builders began offsetting their engines and inclining them at an angle? Their objects were to lower the center of gravity, lower the driver's position by offsetting the drive shaft, and to improve wheel-loading during cornering. Well, Miller designed his rear-mounted six in 1937 with a built-in, steep, 45 degree tilt.

Then there was the damnation of long piston strokes in the early '50's. Miller anticipated that in 1937 with a 3.5-in bore against a 3.125-in stroke. His Gulf six peaked at 6400 but would turn an easy 7000. Its finned cylinder block was an aluminum casting which included crankcase and integral cylinder head. Thin-wall cylinder liners were shrunk into the alloy casting and valve seats were bronze inserts. The housings for the dual overhead camshafts and the sump were of magnesium. The timing gear cover was cast aluminum and included the rear-axle differential housing.

The engine was installed off-center in the chassis for a number of reasons, including the layout of the drive shaft. Power flow was from the rear-mounted engine forward and inboard to the four-speed transmission near the front of the frame. From here the power was transmitted in two directions: (1) forward to the front differential and (2) back to the rear differential. The transmission included the front axle differential and transfer gears for the drive shaft which drove the front

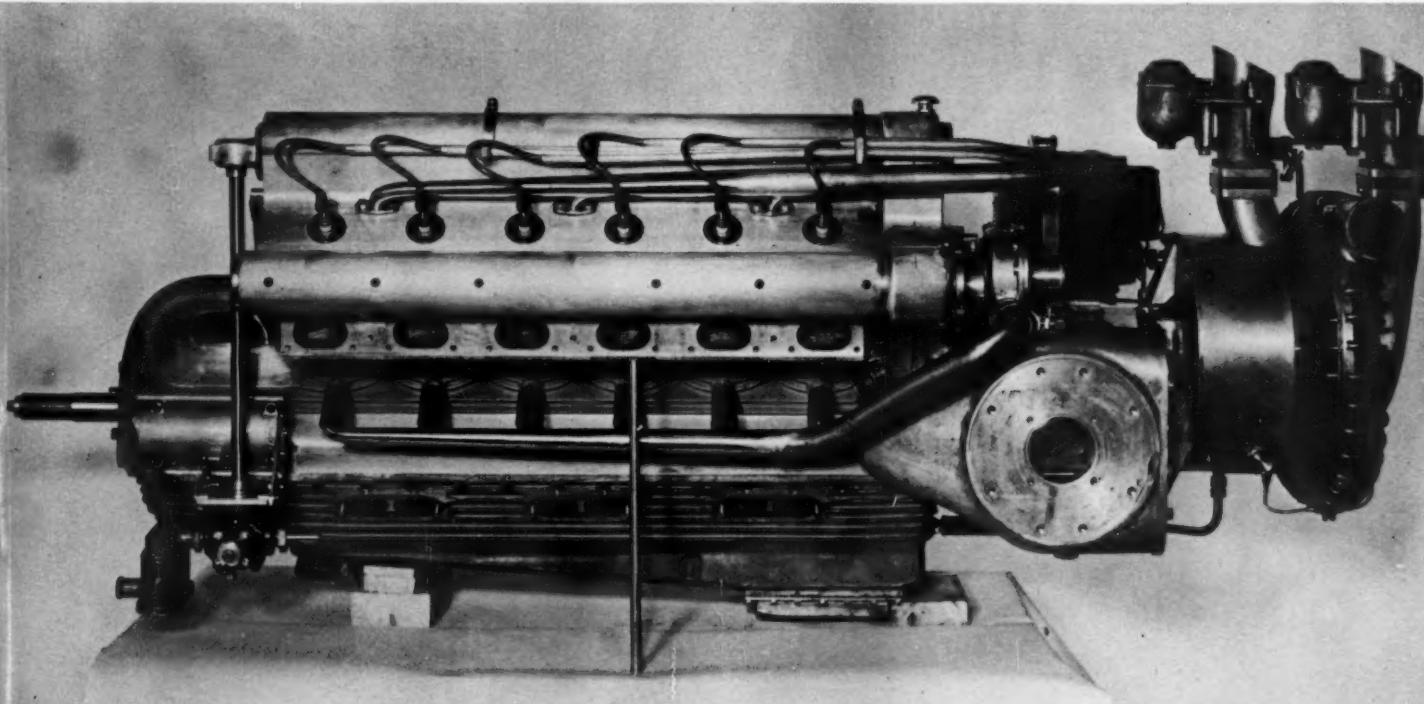
and rear axles. Three overall axle ratios (3.91, 3.97, 4.66) were available by meshing any one of the three transfer gears on the front-and-rear-axle drive shaft with the transmission cluster gears. This was done by removing the cover on the transmission case and shifting the transfer gears manually.

It has been said that no one ever got more out of a centrifugal supercharger than Harry Miller. For his Gulf engine he had an innovation. The ordinary blower of this type has a rotor which is finned on one side. Air is drawn in through an entry port where it meets the vanes of the rotor at its center, is flung outward and compressed against the blower case. In his new design, Miller used two entries, with two carburetors feeding a rotor with vanes on both its faces. With this he obtained 18 psi boost at 7000 rpm. Peak horsepower was 246 at 6400.

One of Miller's associates on this project recalls how, in the presence of a clutch of engineers, Miller estimated the proper diameter for the blower's intake bores out of thin air. Apalled, the scientifically-trained men on the job spent a long time calculating the ideal bore size. Need I say that they came up with the identical optimum dimension? This sort of thing was commonplace, as a result of which a Gulf R&D vice president made this interestingly-architected statement: "Harry Miller impressed his associates as a designer by his outstanding knack of designing racing cars by intuition and past experience, producing results which were comparable to those derived by others using technical methods."

As far back as 1932 Miller had seen and acted upon the possibilities for greater power transmission inherent in the four-

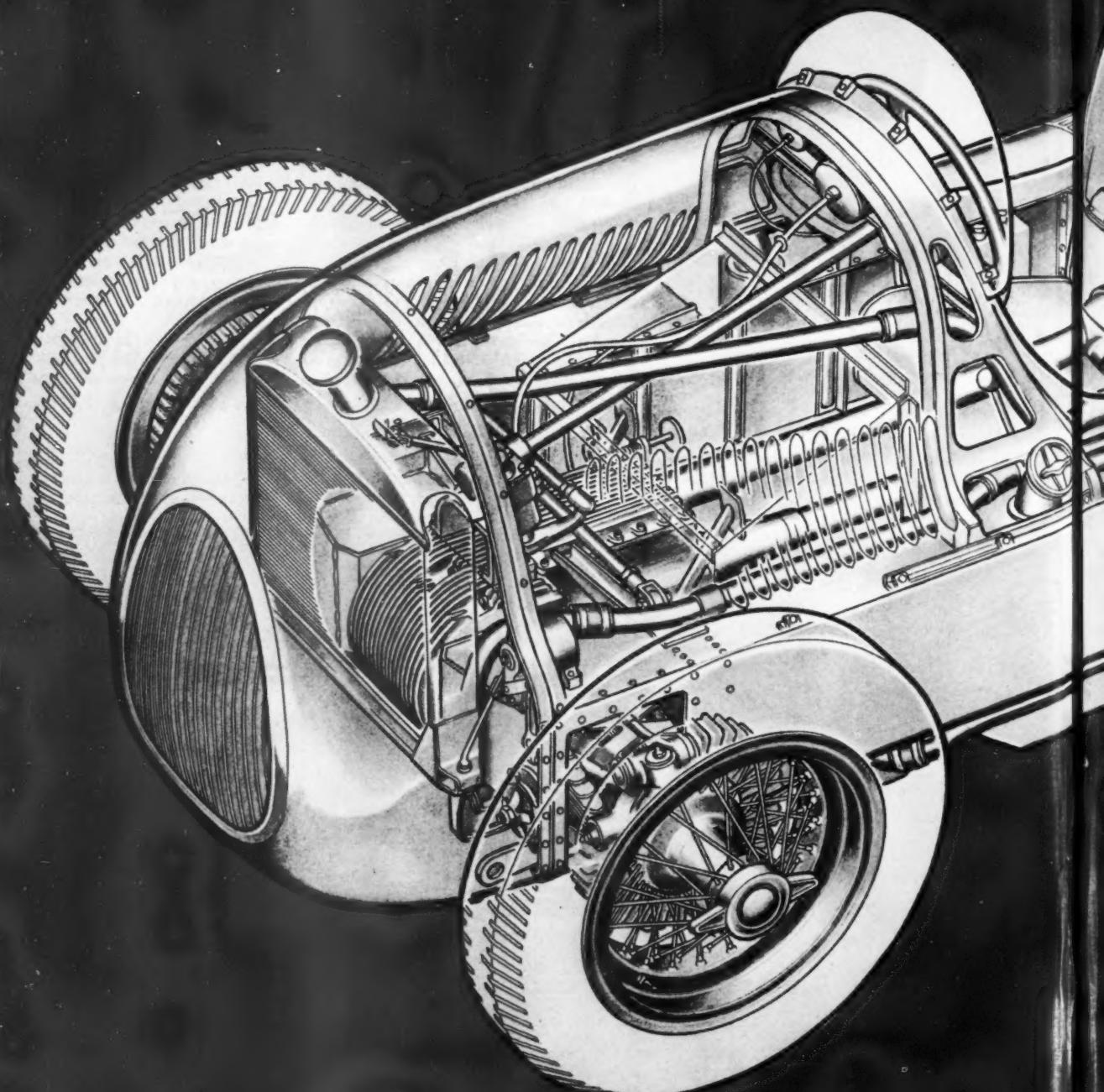
The rear-mounted engine, with a blower on its tail, follows aircraft practice with its nose power take-off. From the transmission up front, the driveshaft to the rear wheels passes closely alongside under the water gallery, terminating in differential casing.

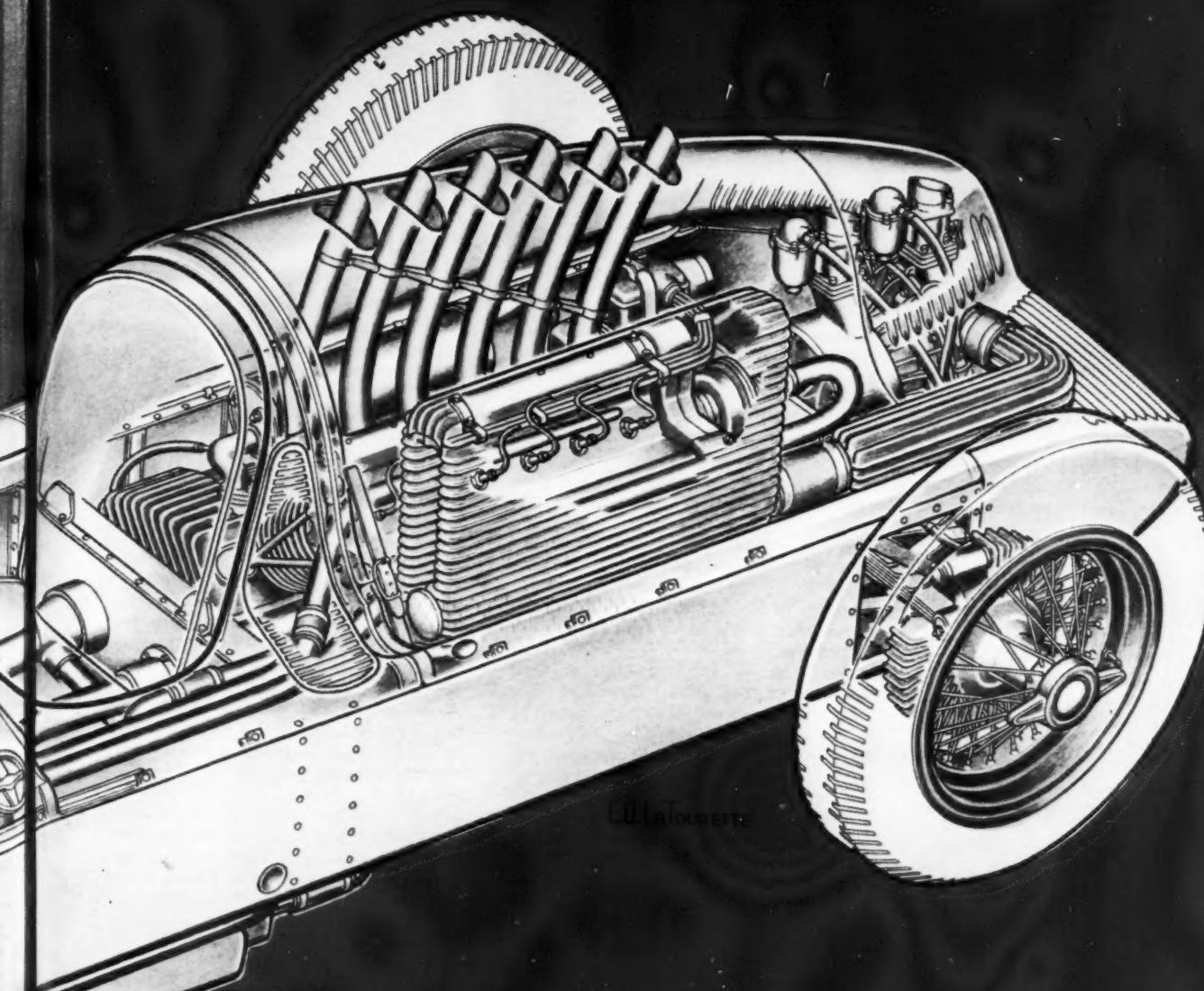


MILLER-GULF - 20 years too early?

INTERNATIONAL RECORDS SET BY
GULF MILLER - 1934 & 1935

Distance	Engines Used	Driver	Record Time hrs.	Miles/Hr Speed mph
100 miles	2	W. E. Miller	1 hr. 10 min.	150.486
200 miles	2	W. E. Miller	2 hr. 10 min.	150.287
300 miles	2	W. E. Miller	3 hr. 10 min.	150.241
400 miles	2	W. E. Miller	4 hr. 10 min.	150.237
500 miles	2	W. E. Miller	5 hr. 10 min.	149.764
600 miles	2	W. E. Miller	6 hr. 10 min.	149.277
700 miles	2	W. E. Miller	7 hr. 10 min.	148.282
800 miles	2	W. E. Miller	8 hr. 10 min.	148.262
900 miles	2	W. E. Miller	9 hr. 10 min.	148.186
1000 miles	2	W. E. Miller	10 hr. 10 min.	148.137
1100 miles	2	W. E. Miller	11 hr. 10 min.	148.074
1200 miles	2	W. E. Miller	12 hr. 10 min.	148.024
1300 miles	2	W. E. Miller	13 hr. 10 min.	148.002
1400 miles	2	W. E. Miller	14 hr. 10 min.	147.988
1500 miles	2	W. E. Miller	15 hr. 10 min.	147.999
1600 miles	2	W. E. Miller	16 hr. 10 min.	147.242
1700 miles	2	W. E. Miller	17 hr. 10 min.	147.387

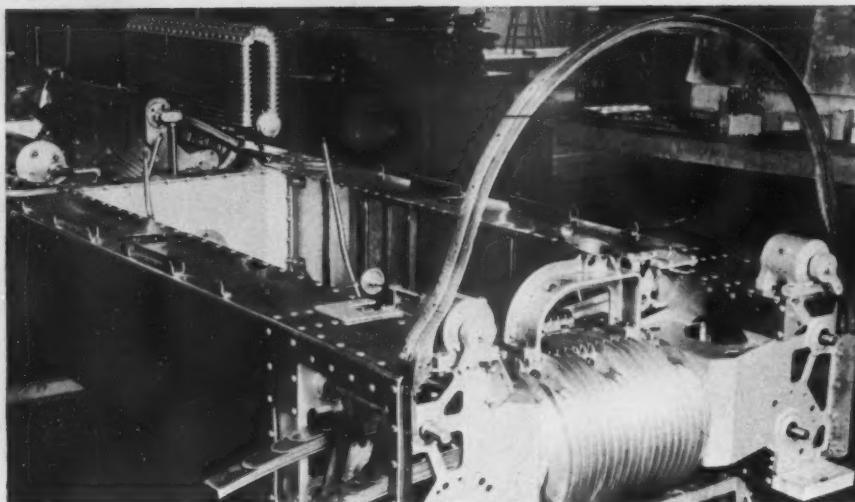




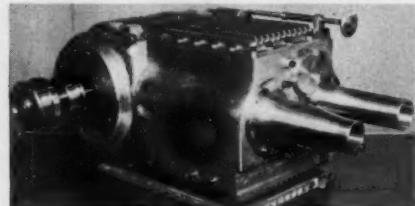
MILLER-GULF

SPECIFICATIONS

Power Unit	In-line six
Valve Arrangement	overhead, 3 valves per cylinder
Bore & Stroke	3.5 x 3.125 in (89.1 x 79.5mm)
Stroke/Bore ratio	0.88 to one
Displacement	108.4 cu in (1803cc)
Compression Ratio	5.46/1, 6.24/1 for Homestead
Carburetion	Dual down-draft carbs, double-entry centrifugal supercharged (running at 4.87 times engine speed)
Max. Power	245 bhp @ 6400 rpm
Final Drive	3.9 (Homestead), 3.1, 3.2, 4.00
Wheelbase	100 in
Track	57.4 in
Suspension	Independent— unequal length wishbones and quarter-elliptic transverse springs, front and rear Front wheel: one Hartford friction-type, one Homestead hydraulic type
Brakes	Master缸
Brake lining area	300 sq in
Tires	6.50 x 15 and 7.00 x 15
Weight	Kellogg-type, 70-spoke knock-off
Length	154.4 in
Height	45.8 in
Width	212.6 in
Front track width	1.36
Front wheelbase	3.12
Pounds per bhp	6.0
Piston speed at max. power	3720 fpm
Brake lining area per ton	354 sq in
Wht. rev. 1000 rpm	25.5 with 3.20 gears



Left, though rear-engined, Miller's Gulf car had gearbox integral with one of its two final drives at front of frame. Below,



engine's torque enters rear side of gearbox through boss at right. Rear wheels' share leaves by left one. Universal joints at front transmit torque to front wheels.

wheel drive principle. He built two such cars for the Indianapolis race that year but they never got properly off the ground. I recently asked famous race-car builder Frank Kurtis for his thoughts on the merits of four-wheel drive. "At present," he said, "cost prohibits such experiments. But with all the horsepower that's available now, you could go much faster if you could apply it to four wheels instead of to only two." Miller saw it coming a long time ago.

We could go on for pages citing Miller's anticipations, his foresight. The side fuel tanks on the Lancia-Ferraris? Miller used them on his Gulf cars. They were separated, baffled, and connected by equalizing tubes so that weight distribution over the chassis remained constant, regardless of the fuel load. Disc brakes are a big thing today. These he had too. They were his own design and imitated a conventional automobile's clutch and pressure-plate assembly. Wheel suspension, of course, was independent all around.

In every detail the Gulf cars were things of beauty. They had to be. Says his contemporary, Ed Winfield, "Miller was the originator, in the American automotive

field of doing an artistic job on his machinery. He was more artist than engineer. The one thing that he insisted upon was having everything well proportioned and well finished even at the cost of quality." But the Gulf people saw to it that in the cars that Miller built for them on their premises no engineering sacrifice was made in the interest of the appearance of perfection. And Miller saw to it that his creations were beautiful. In his mind form and function were inseparable; the excellence of both were insured if the excellence of one was achieved. Study the appearance of any Miller engine (he was an engine-man primarily) to see his passion in practice.

Four cars in all were built at Gulf R&D's laboratory in Harmarville, Penna. The first car was rushed to Indianapolis in 1938 for Ralph Hepburn to drive. The bugs weren't out; it "was completed too late to qualify."

In 1939 three cars were entered in the 500. One crashed in practice, cracked one of its pontoon fuel tanks, and burned to total wreckage. One did not qualify because its driver quit after losing control in a turn at high speed. The third car

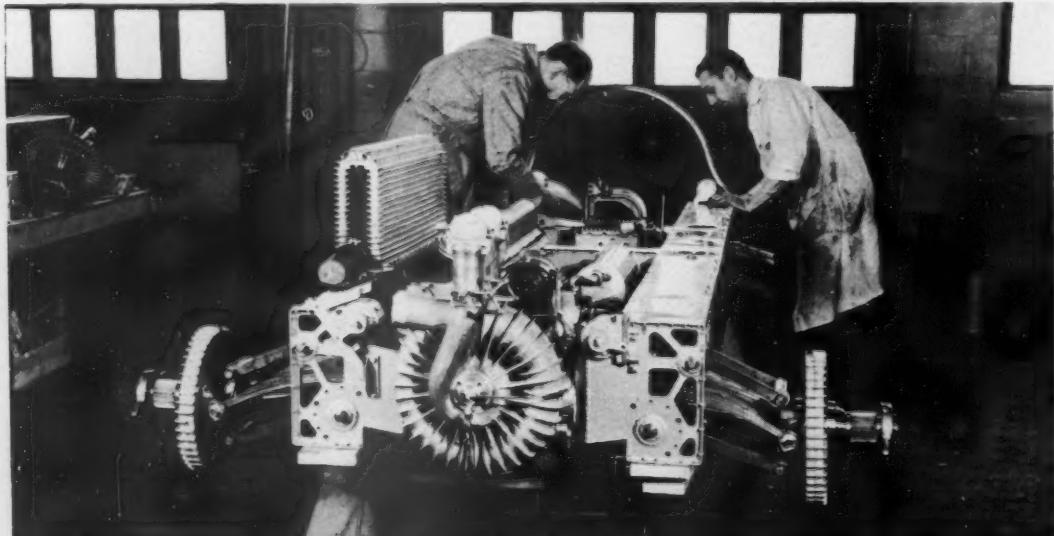
qualified for the race at the then-good speed of 125.8 mph, driven by George Bailey. He stayed in the contest for 47 laps, then retired with a broken valve-spring retainer.

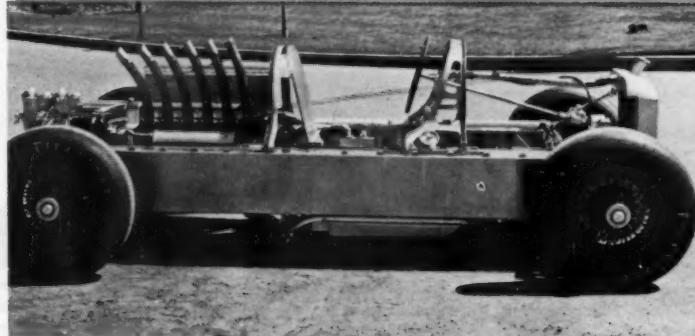
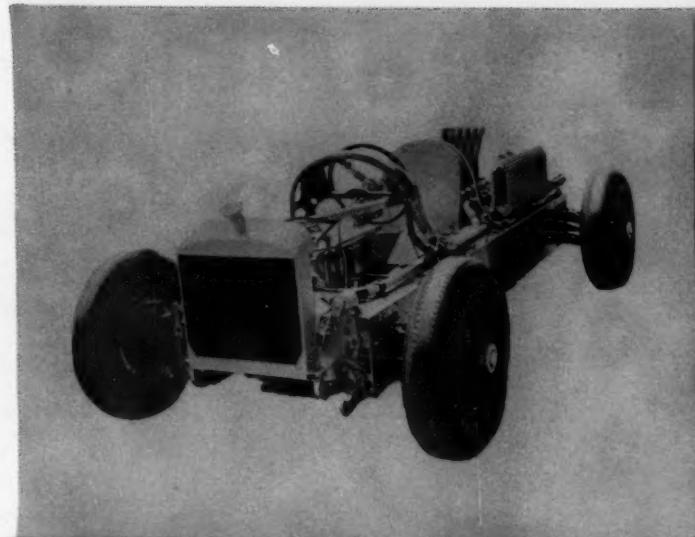
In 1940 two cars were entered. One was wrecked and then further destroyed by fire when its side-mounted fuel tanks also ruptured and leaked what the French so rightly call *combustible*. The AA "suggested" that the remaining car be withdrawn because of the amply-demonstrated fire hazard of the unorthodox fuel tanks.

For 1941 the two remaining Gulf cars were slightly redesigned and wore stainless-steel enclosures around their fuel tanks. They were entered in the big race and they qualified but Fate, impatient with all this dallying, got rough. At 7 a.m. of the morning of the 500 George Barringer's crew began fuelling his Gulf Miller. The accepted although tenuous theory of what followed was that the gasoline's heavy fumes settled on the ground and spread to another garage two doors away. A blowtorch was in use there and there was a tremendous *boom* and, in an instant, Barringer's car was down in flames. It was a total loss. Half of one of the long Indy

(Continued on page 50)

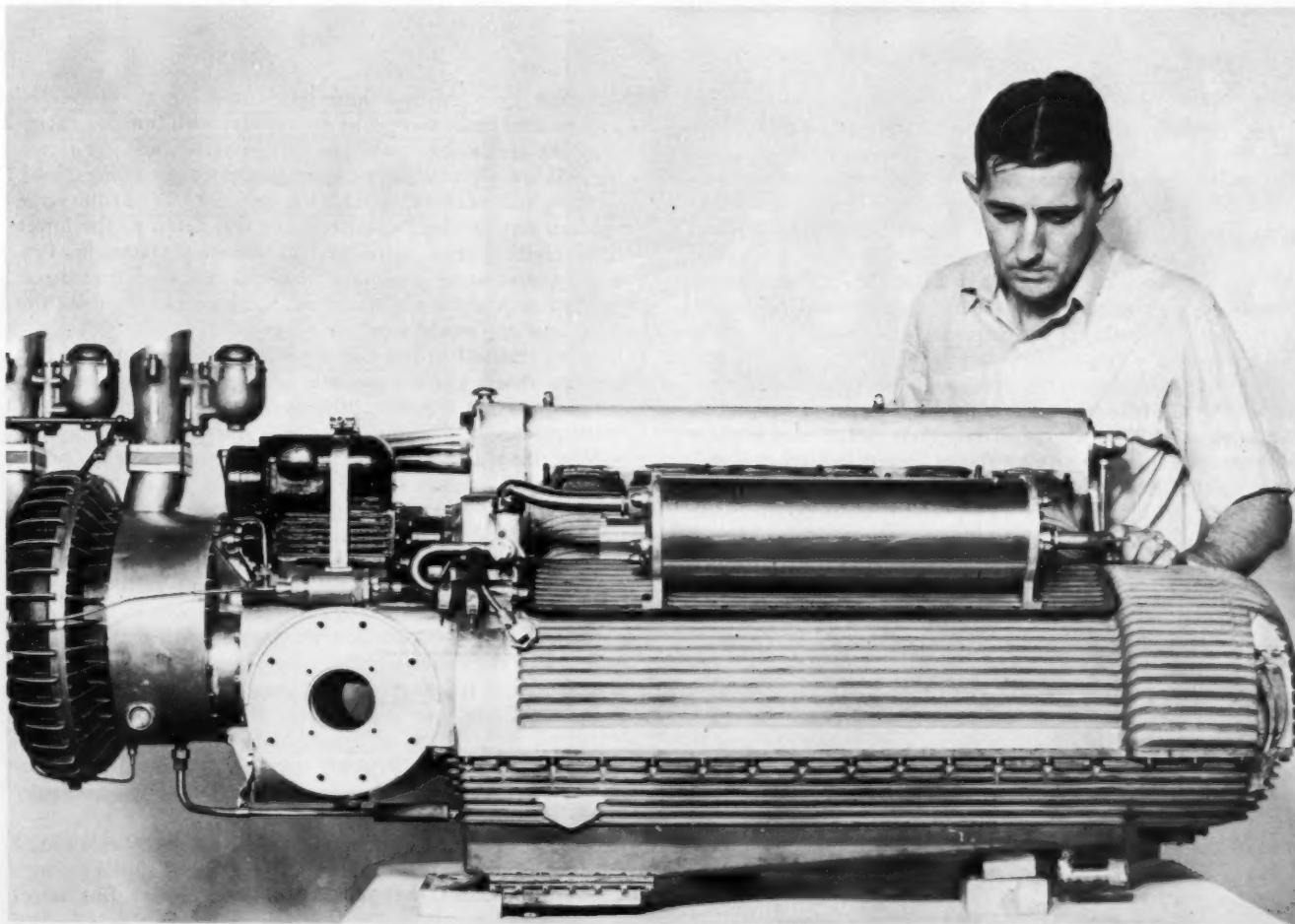
Deep, deep frame rails provide necessary torsional stiffness for all-independent, four-wheel drive.





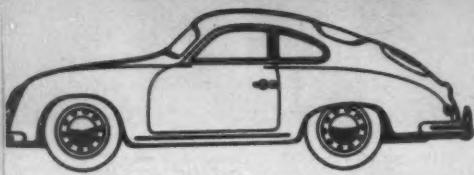
Miller was far and away ahead of recent Indy cars in tilting engine 45° and setting it very low in chassis. Finned casting alongside it is intercooler between twin-faced centrifugal blower and intake ports. Each wheel has two shock absorbers, friction one on lower wishbone pivot, hydraulic one operated by interesting array of cranks and levers.

Miller's 3 liter supercharged six deserves careful scrutiny.





Sure-footed even in the snow, Porsches always corner quickly and flatly.



PORSCHE

A NY MACHINE which is essentially different in concept pays the price of outstanding gains of performance in certain areas with unexpected losses in others. In the case of the Porsche, the major effort in the past nine year's development has been to reduce these losses rather than to extend the gains. The latter course has not been neglected, witness the Carrera, but what is to be made clear here is the sometimes subtle path of design development of this amazing car. The aim of Ferry Porsche and his father, Ferdinand, in building the original Type 356 was to supply a connoisseur's automobile, something in the Bugatti tradition of perfection. They innocently thought that a total of fifty to one hundred cars would saturate the world market for such cars! This sincere, if mistaken, belief may explain why Porsche production has always lagged behind demand. Management, even today, is incredulous at the manner in which the world, and America especially, soaks up their output. Today the story of the post-war prosperity is old stuff to us, but remember, to the Germans it came as pretty much of a surprise.

The earliest Porsches were not much more than hot-rodded, custom-bodied short-chassis Volkswagens. The connoisseurs turned out in numbers, both with money and with advice for improvements. Instead of the reduced-bore 1086 cc VW plant, it was enlarged to 1286, and, since the well-streamlined coupe body would do naught to slow the coupe, aluminum muffs were shrunk onto the VW brake drums so that they could. In 1951, the engine was further enlarged to 1488 cc, in '53 Alfin bonded aluminum-steel drums of eleven inches diameter were fitted. While making these improvements, the factory had discovered that their "Businessman's Express" wasn't half bad as a sports-racing car. Efforts in this

direction soon led to a more specialized car, the Type 550 Spyder, and from this point on (1953), with but one exception, the aim was to make the 356 go *better*, not just faster. In 1955 an all-new three-piece crankcase was inaugurated, severing still another tie with the original VW. At the same time an anti-roll or "stabilizer" bar was fitted to the lower front trailing arms to reduce the Dreaded Oversteer. Previously, and some maintain subsequently too, the fastest method of pushing a Porsche around a corner involved the technique of "wischening" or wiping.

Many climbed to fame on the early Porsches, but the fact remains that a good many others thought the car was just plain squirrelly. Whether this was to cover up their personal inadequacies or not would be a rude question to pursue.

Now this anti-roll bar did not completely answer the problem at hand, namely to make the Porsche handle more like other cars, so during 1955 some more research was conducted on the *autobahnen* that nearly encircle Stuttgart and in the Alpine foothills not far to the south. As this year marked the return to the Porsche company of its pre-war building across the street, doubling working area, the changes in front end geometry were incorporated simultaneously with a major redesign of the frame-less structure's innards. This made the Type 356A, as it was now called, much more suited to series production. At the same time, the cylinder bore was increased from 80 to 82.5 mm bringing the displacement that much closer to the newly current FIA class limits. For the serious lead-foots, a detuned Spyder engine was available in the Carrera models.

Well, if the factory's aim was to eliminate "Wischening: Pro and Con" from the list of hotly debated topics among sports car initiates, they had certainly succeeded. But more

(Continued on page 59)

PORSCHE 1600 Normal Coupe

PERFORMANCE

TOP SPEED:

Two-way average 99 mph
Fastest one-way run 100 mph

ACCELERATION:

	Seconds
30 mph	5.4
40 mph	7.4
50 mph	10.7
60 mph	13.9
70 mph	18.3
Standing 1/4 mile	19.5
Speed at end of quarter	72 mph

SPEED RANGES IN GEARS: (1500-5000 rpm)

I	0-24
II	14-47
III	22-74
IV	32-top

SPEEDOMETER CORRECTION:

Indicated	Actual	Indicated	Actual
30	28	60	55
40	37	70	65
50	46	80	74

FUEL CONSUMPTION:

Hard driving in 20°F. weather 22 mpg

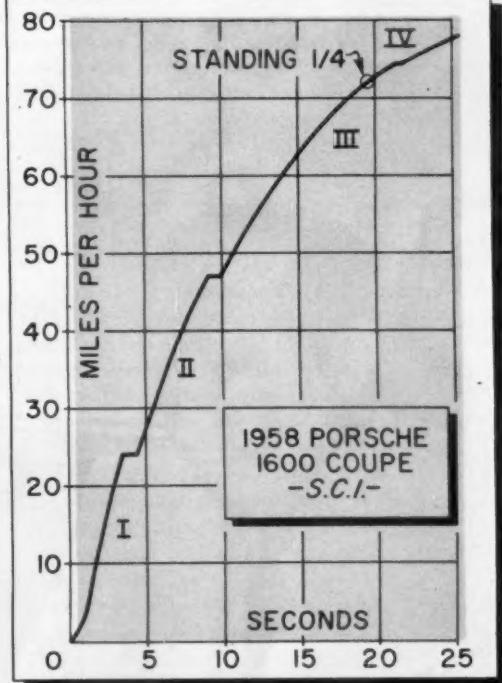
BRAKING EFFICIENCY:

10 successive emergency stops from 60 mph, just short of locking wheels were made at $\frac{1}{2}$ g. More pedal pressure would lock the right rear wheel. At end of test, there was $3\frac{1}{2}$ inches clearance between the floor and the bottom of the depressed pedal.

SPECIFICATIONS

POWER UNIT:

1600 Normal	Air-cooled flat four
Valve Arrangement	pushrod ohv, inclined exhaust valves
Bore & Stroke	3.25 x 2.91 in (82.5 x 74mm)
Stroke/Bore Ratio	0.89/1
Displacement	96.5 cu in (1582 cc)
Compression Ratio	7.5/1
Carburetion by	Two Zenith twin-choke NDIX-32-36
Max. Power	60 hp (DIN) @ 4500 rpm (70 bhp SAE)
Max. Torque	82 ft-lbs @ 2700 rpm
Idle Speed	700 rpm



DRIVE TRAIN:

Transmission ratios	
I	3.09
II	1.76
III	1.13
IV	0.815
Final drive ratio (test car)	4.43 (standard)
Other available final drive ratios	4.86, 5.18
Axle torque taken by	gearbox case

CHASSIS:

Frame	Pressed steel panels welded into box sections, integral with body panels
Wheelbase	83 in
Front Tread	51 in
Rear Tread	49 in
Suspension, front	Trailing arms, laminated torsion bars, anti-roll bar
Suspension, rear	Swing axles, flexible trailing arm, adjustable torsion bars
Shock absorbers	Telescopic hydramatic
Steering type	Z-F made Ross-type worm and roller, steering damper
Steering wheel turns L to L	2.7
Turning diameter	36 ft
Brake type	2LS front, single leading and trailing shoes at rear
Brake lining area	124 sq in
Tire size	5.60 x 15

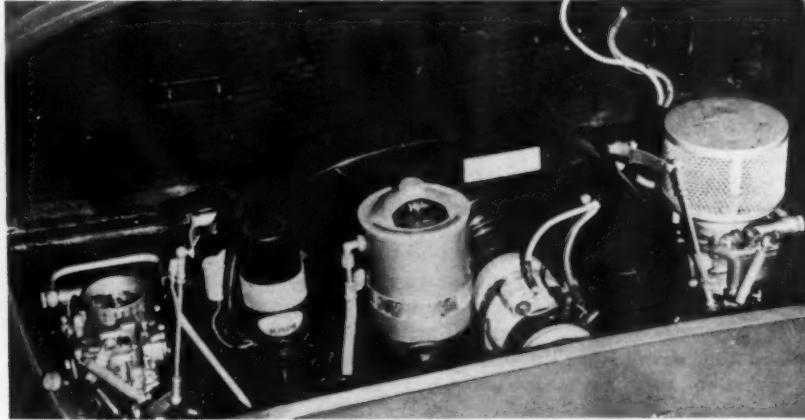
GENERAL:

Length	155 in
Width	65 in
Height	51.5 in
Weight, test car	1875 lbs
Fuel capacity—U. S. gallons	13 $\frac{1}{2}$ U. S. gallons (including 1 $\frac{1}{2}$ reserve)

RATING FACTORS:

Bhp per cu in (SAE)	0.72
Bhp per sq in piston area	2.11
Torque (lb-ft per cu in)	0.85
Pounds per bhp—test car	26.8
Piston speed @ 60 mph	1360 fpm
Piston speed @ max power	2180 fpm
Brake lining area per ton (test car)	132 sq in

Price	\$3700
Distributor	Hoffman-Porsche Car Corp. 443 Park Ave. New York 22, N. Y.



While engine lid's shape nicely suits window outline, access to forward plugs is cramped. However, engine removal is easy, even at home. New linkage, dual-throats are welcome features of new Zenith carburetors. Exhausts zig-zags to shrouded openings in bumper guards, like Detroit!



NOT ENOUGH ODDS

by D. M. Bartley

IT IS QUESTIONABLE that ever in the history of racing has there been an event fraught with so many complications and tensions as the second Grand Prix of Cuba. The accident, which unfortunately killed seven spectators and injured 30 more, was not nearly as serious as that of Le Mans in 1955, but the political tension which culminated in the unbelievable kidnapping of world champion Juan Manuel Fangio, the fantastic number of armed policemen and army men crowded into the pit areas, guarding the Sports Palace, stationed at very close intervals around the entire 3.46 mile circuit and even in the hotels where the drivers and crew members were staying; all this made it impossible to forget that one was in a country on the edge of serious revolt.

The abduction itself was accomplished with incredible ease. The night before the race one man walked into the crowded lobby of Fangio's hotel, leaving two cohorts standing at the entrance. The man walked inconspicuously over to Fangio's chauffeur who was standing several yards away from the desk where Fangio was talking with friends about where they should have dinner. The man quickly frisked the chauffeur, then moved over to the group at the desk, showed his gun and spoke quietly but directly to the champion.

"You are Fangio?" he said. "Will you come with me, please, I am from the 26th of July Movement. Don't resist and you won't be hurt." (Fangio said later, "I felt he meant it.")

The two men blocking the entrance then let their pistols be seen. As the abductor walked Fangio out of the lobby, he said again to the astonished people in the lobby, "Don't move or I'll shoot," and that was the last anyone saw of the five times world champion for the next 29 hours.

With this, the entire city of Havana went wild. Moments later, the newspapers and wire services received phone calls saying, "This is the 26th of July Movement. At 8:55 p.m. we kidnapped Fangio." And within the hour, a cordon of police so tight that a cockroach couldn't have passed through it unidentified was thrown around the perimeter of the city.

Of that first hour, Fangio says, "Just outside the hotel was a car. The three men with me were very courteous and said please, would I lie down on the floor of the back seat because they didn't want me to be hurt if there was gun fire. I did. They took me to a home where we stayed for perhaps 15 minutes. Then I was put into another car and driven—for not very long—to another house in the suburbs where I was kept for less than half an hour. I did not know where we were; I don't know the city of Havana well. I was in the back seat on that trip. I asked if they had a hat I could borrow since I didn't particularly want to be recognized then." (A Latin himself, Fangio is not unaware of the "shoot now, think later" temperament.) "Finally I was escorted to yet another car in which we traveled to a third home where I was kept until my release."

That night and the next morning, the homes and haunts of all known rebels, their friends and neighbors were searched without avail. On race day, practically every important official in Havana received anonymous phone calls, but what these unknown callers said to them—the police, the Sports Commission, Marcello Giambertone (Fangio's manager), the Argentine consul, the ambassador and the newspapers, wire services and radio and television stations—varied a great deal. Fangio was in safe hands and would be returned—immediately; for ransom; later; right after the race; at an



D. M. Bartley

Spectators gather at foot of monument to sinking of battleship "Maine". This sparked American intervention in Cuba, ending Spanish domination. At right, Moss speeds along the Malecon in North American Racing Team's 4.1 4-cam Ferrari, owned by Chinetti, de Vroom and Arents. Below, Fangio, released by rebel kidnappers many hours after the race had been stopped, recounts his experience.



Wide World

unmentioned future date; Fangio would not be returned — ever. Fangio had been delivered to an address on the farthest side of the city from the circuit. Fangio was already in the distant headquarters of the revolutionists in Oriente Province. And no one—President Batista, the Argentinian officials, de Tomaso or Fangio's many other friends, nor the rapidly-growing horde of reporters and photographers—had the slightest idea which calls were genuine.

In the meantime, Fangio had not been having a bad time of it. "In the third house, after many more apologies by my captors (who seemed to be genuinely sorry that they had felt the need of involving me in their political matters), I was given a pleasant bedroom and had a good night's sleep in a comfortable bed. Probably the room was well guarded but I was not made aware of it.

"In the morning a woman brought me coffee, then breakfast in bed." Fangio grinned as he continued. "I must say that the 'accommodations' were in every way as good as those of a first-class hotel!

"I passed the morning and early afternoon in pleasant conversation with these men who did not seem to be bad sorts at all. They asked me if I wanted to watch the race on television but I said 'no.' Later that evening I did see television films of the accident. It was terrible."

As the hours passed from late afternoon into evening after the race, there was real concern for the champion, for there seemed to be no reason beyond their own self-protection that his kidnappers should not now return him. Finally, late that evening, the revolutionists telephoned an address to the Argentine ambassador, saying that Fangio would be found there. Around 11 p.m. he was again moved, for the fourth and last time, to a home on the outskirts of Havana, escorted into the empty house and told to wait there. He had not

poses. It is a *fait accompli*. The Cuban public undeniably felt that the successful abduction of Fangio proved that the rebels had a good deal more strength than expected. Further, they were effective in delaying the race, in drawing attention to the expenditure of government funds on sporting events when, in the opinion of the revolutionists, such funds should be spent instead to alleviate Cuba's serious unemployment, and unquestionably proved that the tremendous number of police were totally ineffective in protecting any given individual.

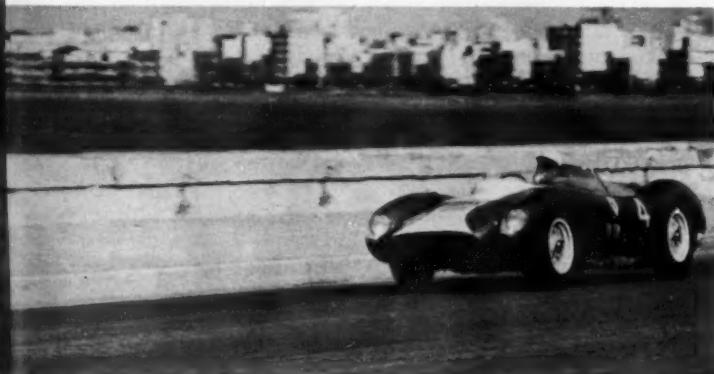
Even excluding the general tension so heightened by the Fangio kidnapping, the over-all organization of the Cuban Grand Prix was very bad. Less than a week before the race the organizers realized that they had no flags. On practice day, one of the flagmen attempted to indicate that there was oil on the course by waving *both* the red and yellow flag simultaneously. (And what was he doing with a red flag anyway?) The day before the race, the organizers still hadn't been able to obtain competent time-keepers, and less than one hour before the race began, I was asked if the time-keepers might borrow my stop watch. There was no communication between flag stations. The loudspeaker was unintelligible out on the course. At the time of the accident, red flags were waved near the site of the crash, but not elsewhere. And such proximity of spectators to the road should not, of course, have been permitted.

The brief race actually began about 1 1/4 hours late, partly because it was rumored that Fangio had been released and was on his way to the circuit, and partly because of incompletely organized. Gregory in John Edgar's old 4.9 Ferrari was first off the line. Moss quickly passed him in the North American Racing Team's 4.1 Ferrari. Then the Englishman held a very narrow lead for most of five laps, with Carroll Shelby in a 4.5 Maserati not far behind in third. On the fifth lap, Gregory passed Moss into the lead. Moments later, the Cuban driver Cifuentes lost control and plunged into the crowd.

In spite of all the poor organization of the race itself, the rescue work was quick, effective and totally above criticism. It was necessary to stop the race in order to get the injured out of the infield to the hospitals. Within a very short time, the ambulance teams had all the victims delivered to hospitals.

At the time of the accident, the drivers suffered considerable confusion. Red flags were shown at the accident site immediately, but not everywhere else. Because some drivers remembered the mis-use of the red and yellow flags during the previous day's practice, and others knew that according to regulations only the Clerk of the Course had the authority to stop a race, the response to the flags was far from uniform. Gregory, in the lead, slowed immediately at his first sight of the red flag at the crash scene. Moss didn't, and passed Gregory before the finish line. Moss was consequently awarded first place, the five laps constituting, according to F.I.A. regulations, a completed race under the circumstances. But the solution was clear, as Moss and Gregory agreed to split their prize money. Shelby was a definite third, but there is not much accuracy for the remaining 23 places.

As the rescue work continued, there was much concern in the pits as to whether or not someone had poured oil on the course, for a number of drivers agreed that they had never seen a road so slick. When one remembers that two practices *each* had been held for stock cars, production sports cars, motorcycles and modified sports cars in the two days preceding the race; that *all* of the first three groups had already raced on the course, laying down no small amount of rubber and oil during these preliminary races; that Mieres' Porsche had already stopped because it had lost *all* of its oil; that after four laps, Perdisa's Maserati was in the pits because it needed oil and that Bob Said's Ferrari clearly could be seen to leak a trail of oil through the corners, the suggestion of sabotage recedes into the ridiculous.



been there long when the Ambassador himself arrived.

Fangio does not have a great deal to say about the entire incident, beyond what has already been quoted here. He does not know who the men were, "doubts" that he would recognize them again, has no idea where he was taken. He repeats that he was consistently well treated.

As for missing the race, the champion summed it up neatly. "No, it was a sad race. I am not sorry I wasn't there."

Several days after, a cartoon appeared in a Havana paper which delighted the champion. It showed him being forced at gunpoint into the driver's seat of the kidnap car. The caption read, "Now you drive and then we'll see if they can catch us!"

Later Fangio told me that the only real concern he had had during the entire incident was that the rebels would find a way to take him to Oriente Province.

"I had visions of myself, bearded and wearing a forage cap, being forced to drive arms trucks up and down those mountain trails!"

It is futile to discuss the impropriety of the revolutionists in taking a great sportsman in order to further their pur-

Before the start, spectators make last minute decisions about which side of the road to watch from; while in the pits, center, Shelby and Gregory confer.



D. M. Bartley

CUBA '58 (Continued)

Cifuentes certainly did everything he could to prevent the accident, but he was in over his head, so to speak. An amateur driver of little experience, like some half-dozen other drivers at Cuba, he should not have been accepted in a race of this calibre. The situation he found himself in initially was not too serious nor uncommon. Perhaps a well-experienced driver could have recovered without difficulty; Cifuentes did not.

It is, of course, true that any driver can lose control of his automobile at any point on any course in the world. The real question is that of making the best possible odds against such an accident involving any spectators.

At Cuba, the very nature of the course makes for poor odds. It is a long narrow loop running in gently sweeping curves following the shoreline for perhaps a mile and a half on Malecon Boulevard, followed by a half mile or so of connecting narrow streets which loop back to a shorter land-side stretch of the Boulevard, along which the pits were located. For some distance on either side of the little park between the two long curved stretches is a 50 foot-wide grass boulevard. Spectators were massed to the curb on both sides of this boulevard, as well as around most of the course. One reporter remarked that it looked as though they used spectators for snowfencing.

Beyond the danger inherent in the course itself, more problems stemmed from the fact that the entire organization was handled by the overworked personnel of the Cuban Sports Commission. Mr. Ernesto Azua, its competent director, worked incredible hours, but his ability to take care of all of the details of a major international race was seriously hampered by the work required from his Commission to arrange and promote two other major sporting events in the same week.

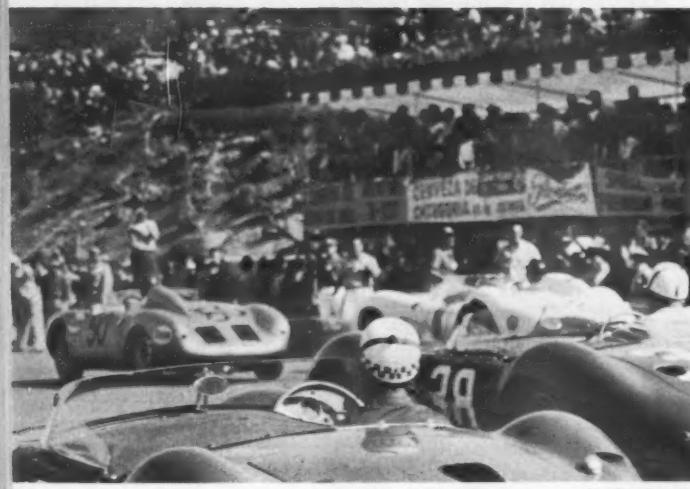
Without a doubt, he and everyone else involved with the event did their best. The conclusion must be that the best was not good enough. The F.I.A., which sanctioned the race again, having known that in 1957 spectators were permitted dangerously near the course, sent no observers to Cuba. The Cuban Sports Commission, with the best intentions in the world, set itself a job which no such small group of people could have handled properly. Human beings can accomplish just so much in a given length of time. They made a further error in not re-inviting such well-experienced racing officials as Canestrini, Kovacevitch and Bologna, who were of immense help last year.

Furthermore, as Nello Ugolini, team manager for Maserati, points out, the time has come when there *must* be qualification trials for entrants in international races. The seven people who were killed did not die as a result of a fluke accident like that of Le Mans. They just didn't have enough odds.

D. M. Bartley



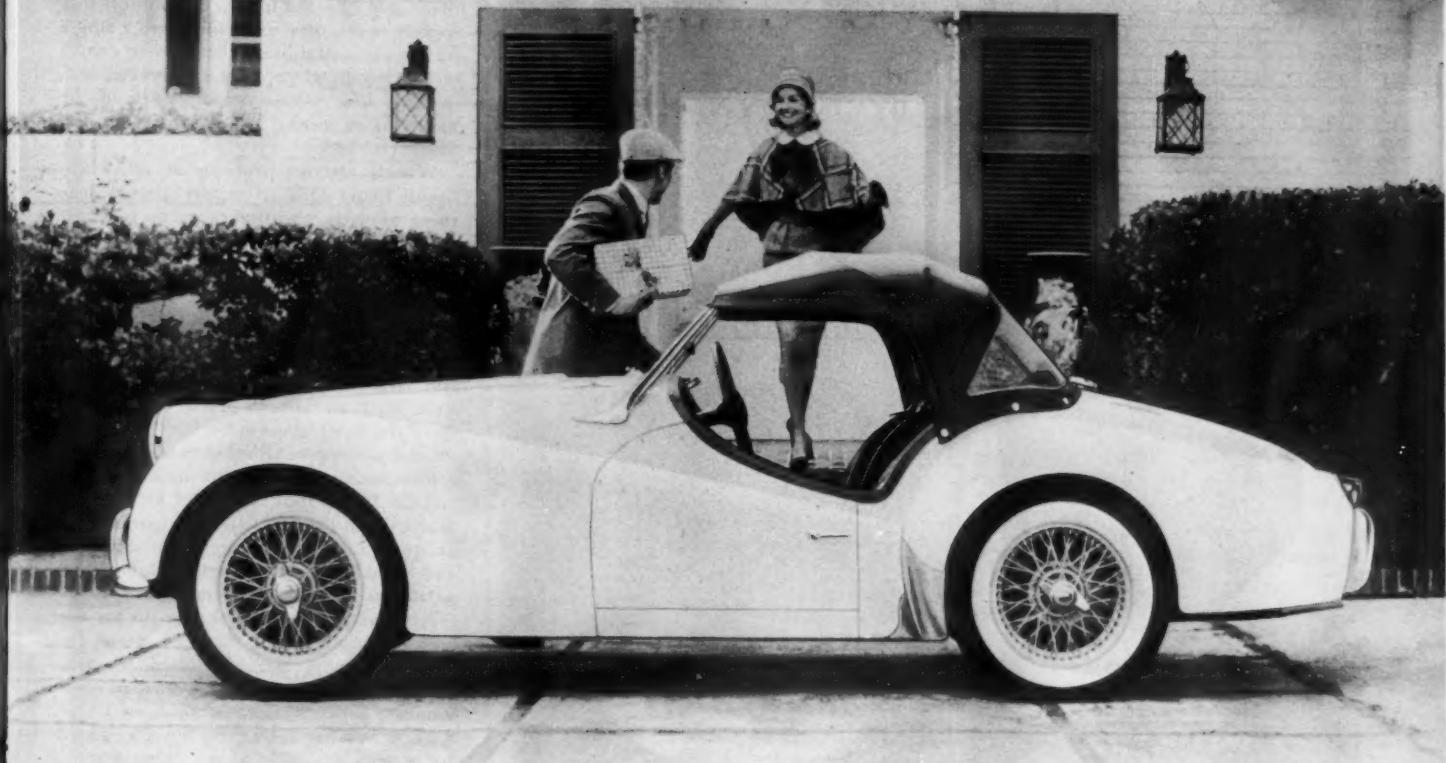
D. M. Bartley



D. M. Bartley

After a fleet-footed Le Mans start, the course was crowded with speeding sports cars. Beyond Crawford in foreground are Mieres, Hill and Schell.

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BUILD IT RIGHT

(Continued from page 27)

you. For a large car, the Chevrolet close-ratio four-speed box would seem to be ideal, and I would like to modify this box so that it could be assembled into a single unit with a Halibrand final drive center section modified to carry the brakes, too, so that the whole assembly could be mounted as a unit. (See Sadler Special, SCI, Feb. '58.)

Wheels are no problem at all, Halibrand being able to supply almost anything to order, and brakes are no problem on a small car, the designer having a choice between a number of good drum brakes or at least one proven disc brake. For a large car the problem is not quite as easily solved. Both Ferrari and Maserati have tackled the problem by simply using larger and larger brakes, until those on the 4.5 litre Maserati almost touch the ground. Only the English seem to have done any serious development work on disc brakes. A most promising development is the Cerametallic lining that Chevrolet are making available on the Corvette which will work at quite fantastically high temperatures, and I look for further developments in this particular field in the near future.

Another promising brake set-up for the larger specials lies in the 1958 Buick bimetallic drums recently tested by SCI. Drums similar to these were used in combination with cerametallic shoes by Chevrolet at Sebring with great success. These are readily available, if not from dealers, from regional Buick supply depots. Heavy wire knock-off wheel adapters and wheels for these hub-cum-brake combinations can be had from Dayton Wheel Products, Xenia, Ohio. Halibrand also can supply either knock-off or bolt-on wheels.

For smaller specials the choice is almost unlimited depending only on the machining facilities available and the builder's ability to get this work done at reasonable cost. Where no such facilities are available, MG hubs, spindles and brakes can be used with Alfin drums. These last can be purchased from many foreign auto parts jobbers and will replace the standard drum without changes to hub or drum. (Editor's Note: The author used just this method on both R-1 and R-2.)

If some form of VW or Porsche suspension and road gear has been used or is being contemplated, the answer is simple—use the Porsche brakes in their entirety. These are virtually fade-proof and are completely interchangeable with the VW parts. However, if very late model Porsche front brakes are to be used, the late spindles should also be acquired since changes have been made to stiffen these.

On two specials of note, the Meyer-Drake special built by George Beavis and the very fast (if not too consistent) Singer built by Kelly Buchanan, the two-leading-shoe brakes from Dodge and DeSoto circa late 1930's were used to great effect. Buchanan used them on all four wheels while Beavis was content to use the more standard procedure of mounting 2LS brakes on the front only with single lead-

(Continued on page 46)

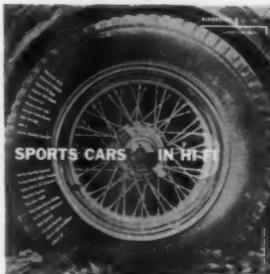
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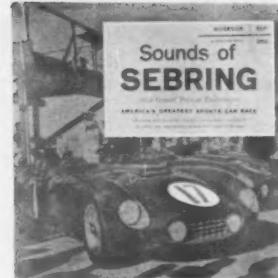
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BUILD IT RIGHT

(Continued from page 44)

ing, single trailing shoes on the rear although all were DeSoto.

The problem of finding suitable suspension units, for the front end at any rate, is fairly easily solved for the smaller and medium sized cars. As was pointed out in the first section, most manufacturers build their units with far more than merely adequate strength in order to assure themselves that some of their more ham-fisted customers won't get into trouble. The result is that the suspension units of fairly small production machine can be used for a seemingly much larger competition car or one which has much more potential. A case in point is the use of the lightened MG units used on the Hand Special (SCI August 1957). The upper A arms are standard Armstrong shock absorbers as taken from the MG TD, carefully drilled for lightness. Spindles and spindle supports are also TD but carry TF backing plates, hubs and the Alfin brake drums mentioned earlier. The lower arms were made up to standard TD specifications but the material used was one inch, .083 wall tubing and fitted with shackles to take a transversely mounted, shortened Ford leaf spring. The set up is reminiscent of early Ferrari practice and while torsion bars might have been a better choice for obvious reasons, the unit has two advantages—it fits the criterion of simplicity and it works.

An even simpler approach from the standpoint of fitting is that found on the Elva Mk I in which the entire unit including front beam from the Triumph (Standard) Ten sedan was grafted on to the Elva frame. This was a method also used by Kelly Buchanan who set the Singer front crossmember and suspension system into the main tubes of his special. The unit was liberally lightened, of course, but other than that was exactly as removed from the original car.

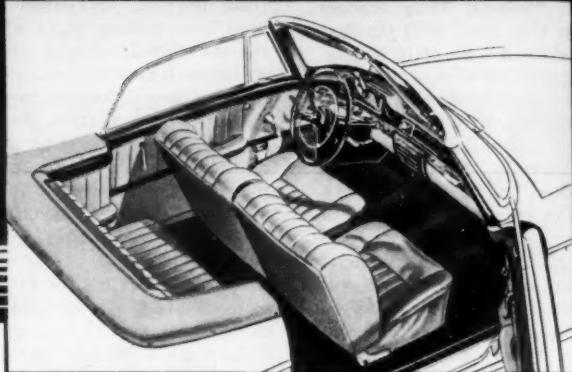
The more experienced among the readers will undoubtedly notice that we have left much unsaid—such things as exact recommendations for engines, tubing sizes and other details large and small. The reason for this is that each of these has either been covered in exhaustive detail in SCI before or that the subject, engines for example, is best left to a more detailed discussion than the scope of this series will allow. These omissions, if not covered earlier, will be covered in the detail they merit in later issues.

Much can be gained from a study of the center spread cutaway drawings that have appeared in the past. Pay particular attention to those falling into the class in which one is most interested. These cars have used widely divergent means to achieve one basic goal—performance. Some means are better than others and some may not combine readily with one's own plans though desirable in a different situation. However the drawings all bear study and a critical assessment to see how others have successfully accomplished the goal before one sets pencil to paper or torch to steel. Then when you do start, you'll be set on the right track to building it right.

—Ken Miles



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KILO RECORD

(Continued from page 23)

Union in the quarter-mile, although beyond that they would be washed up. In the same year enthusiast Douglas Hartelt of Santa Ana, Calif. turned his efforts seriously to international record breaking and built the modified Chrysler engine that powered the ill-fated Carillo streamliner that crashed at about 220 mph at Bonneville that year.

Then Hartelt met Santa Ana dragster builder and pilot, Cal Rice. They had a common interest in going faster than anyone else and Hartelt agreed to handle engine requirements if Rice would take care of the rest. Rice and his friends Melvin Dodd and Jack Hart designed the channel-frame chassis, incorporating all they had learned in years on the drag strips concerning the subtleties of steering, handling and weight distribution at g's so controversial that they are best not specified in this article.

The car's first engine was a side-valve Mercury and, with Rice at the controls, it showed real promise from the start in late '54. After the team had felt its way and gathered knowledge with the flathead, Hartelt dropped a 343 cu. in. (5619 cc) Chrysler V8 into the car, adding a big, fuel-injected GMC Roots blower driven off the nose of the crankshaft. This combination mopped up. Some high points were its winning of the National Drag Racing Championship in 1955 (still with the flathead!) with an elapsed time of 10.30 secs. for the standing quarter-mile, and a 9.99 ET at the annual championship meet in '56. Then, late last fall, Rice tried his luck on the standing half-mile at Riverside International Raceway. Burning pump gasoline he clocked an ET of 14.86 secs. and a top speed of 161 mph at the end of the trap.

Wally Parks, president of the National Hot Rod Association (membership is over 70,000), got busy with pencils and slide rule in an effort to relate this performance to Auto Union's World Record for the kilo. His figures convinced him that Rice should have no trouble in topping the German record by at least the required one per cent. Parks then took a careful look at Auto Union's Class C record, studied performances of cars in that class and decided that Ed Cortopassi's *Glass Slipper*, a beautiful car that had been clocked at over 160 mph at the end of the quarter-mile, could do the job. Parks contacted the owners of both machines to ask if they would be willing to contend in the Big Time and they pounced at the challenge.

It took Parks from October to January to organize the assault on the Auto Union records. To USAC and FIA such events are sacrosanct and sanction is granted only after careful consideration of the applicant's qualifications and intentions. Parks obtained his sanction, the official support of Mobil products, Champion spark plugs and Firestone tires and, most difficult, the use of a 13,300 foot air strip, 200 feet wide. He, Rice and Cortopassi also wanted to gun for Auto Union's one-mile acceleration records.

The Americans' chance to prove what individual initiative and amateur talent can do with fast machinery came on Jan. 26. The record attempts were due to begin at 7 a.m. — the same hour at which the German runs had been touched off two decades before. Engineers from Detroit were there, tire experts from Akron, USAC top brass from Indiana. Everybody was on hand but the event was rained right into the mud by one of Southern California's rare and unpredictable deluges.

One week later the cast was assembled again in spite of the direst predictions for rain. But the winter sun rose in a cloudless sky and all hands fell to the job. Because they were after the Big One, the Rice car was sent off first. Hartelt filled its fuel tank with straight methanol, fired the blown Chrysler with a push start, burned three gallons of fuel in a mere half-mile of warm-up puttering around the pit area, refueled and turned the car over to Rice.

We all were worried about the handling of this car with its solid, non-suspended rear axle, at speeds and distances it never had been exposed to before. But Rice coolly belted himself into the cockpit and when USAC's Reeves Dutton dropped the green flag Rice performed one of those feats of skill that can only be appreciated by the exceptional driver who has unleashed a machine that packs only three pounds for each of its rated horses. Letting out the clutch just enough and feathering the throttles just enough he sent the car down the chute with scarcely a puff of smoke from the big, slick-tread rear tires. He kept them rotating just a whisker ahead of the car's actual velocity, getting optimum thrust with minimum slip. The orange-red dragster shrank from sight with incredible speed, the crack from its eight exhaust stacks seemingly right at the limit of the auditory organ's resistance to permanent damage. Rice vanished in the distance with appalling suddenness, fishtailing very slightly all the way. His average speed for that run was 117 mph . . . on straight methanol. After that he called for 15 per cent nitromethane. "I'd like to have a little something in my favor," he explained.

Because of timing troubles and other delays Rice had to make six one kilometer runs in order to get the two within an hour required for an FIA record. That is equal to 15 flat-out quarter-mile drags, but the big Chrysler ran with the slogging regularity of a commuter train. At one end of the kilo O. V. Riley of Chrondek timing repute had a trap set up with photo-electric cells tripping an electronic timer. Rice recorded better than 180 mph as he broke the light beams and spectators caught a fleeting glimpse of a driver pinned by tremendous wind pressure to the back of the car's open cockpit, the flesh of his face caved in around its bones. Parks' calculations were solidly founded and Rice broke the World Record by a decisive 5.3 per cent.

The Class C contender, Cortopassi's better-streamlined *Glass Slipper*, ran with the same predicted success. It differs from the Rice car in several basic ways. Its 301 cu. in. (4931 cc) engine is a Chev V8, unblown. It uses high gear only, while the Rice car makes its starts in the second gear of its three-speed transmission. The *Slipper* also has its rear axle solidly mounted

(Continued on page 52)

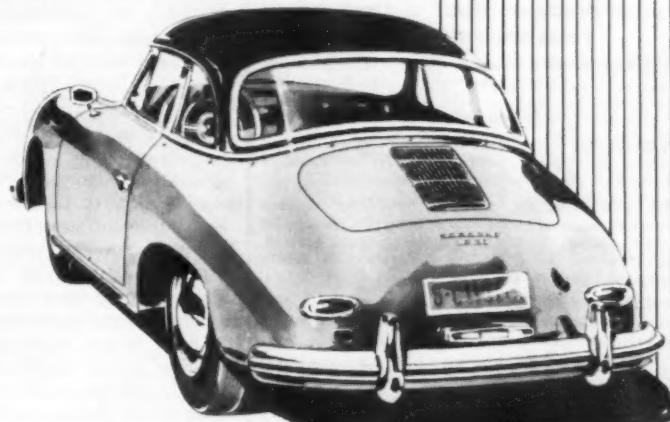


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MILLER-GULF

(Continued from page 37)

garage buildings was gutted and the cash customers were lucky to get to see a race at all. The other Gulf Miller, driven by Al Miller (no relation) stayed in the race for all of 22 laps, then dropped out with a locked shifting mechanism.

This left one of the four original cars extant. It was sold to Barringer who raced it at Indy in 1946 under the name of Tucker Torpedo Special, in honor of his patron who later made fame when he tried to crack the car-manufacturing field. Barringer lasted for 27 laps before he was forced to retire by the failure of yet another five-cent item, a transmission thrust washer. Barringer lost his life in a racing accident later that year in Atlanta, but not in a Gulf car.

In 1947 the last of the Gulf Millers was entered in the Indy 500 by Preston Tucker under the name of the Tucker Partner Special. Name drivers sought luckier mounts and rookie Charles van Acker did his best. Once again the 30-lap barrier proved insurmountable and van Acker spun and crashed on the 24th round. That was the end of the Gulf cars at Indy.

These cars were hounded by annoyances that usually were petty and always were decisive. But they were phenomenal machines with an immense potential that hostile fate prevented coming to fruition. But there was one historic occasion when things went right and some of this barely-tapped potential was revealed.

It was in 1940, after the Indianapolis race—meaning after two crashes and a bad spin-out by these cars—that Barringer took one of them to Bonneville. His objective was simple and sound: to make an exhaustive study of this very unorthodox car's handling qualities on the world's safest high-speed course. As you can imagine, the combination of rear engine, plus drive to all four wheels, plus lack of differential piloting problems. Barringer learned the answers. He established the fact that the Gulf Miller configuration behaved much like a front-wheel drive vehicle. When the rear end would begin to let go in a turn the car could be pulled right out of the impending spin by just punching the throttle. Barringer felt this to be an advantage over normal rear-wheel drive, where all you can do to correct a spin is steer like mad . . . and hope. Also, the front-drive "pulling out" effect was even quicker with all four wheels being driven. Nevertheless, it was a very tricky car to drive because, on sudden closing of the throttle it wanted to swap ends and to stay out of trouble the driver had to culti-



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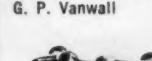
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With these characteristics pinned down, Barringer had the answers to the car's few but fairly crucial behavioral peculiarities and, since it was running faultlessly and fast, he decided to attempt some international records. It was in July, a bad, slushy month on the Salt, but car and driver were there and the AAA was called. The original plan was to knock over the Class D (up to 3 liters or 183 cubic inches) sprint records which were held by Britain's Staniland at just under 140 mph. Barringer boosted these by as much as 18 mph (158.446 for the flying 5 km) with such ease that there was no point in not going after a passel of distance records too, with the result that he mashed ten of these by massive margins.

These performances by a 3-liter open-wheeled race car running on 80-octane pump gas and on a mushy surface proved that the hated-by-some, beloved-by-many Old Man had lost nothing of his touch as a designer of pure bred racing machinery. But Harry Miller's later years were inexorably jinxed and even his best efforts bore little fruit.

Miller helped to jinx himself in many ways. One was his inability to sustain his interest in a project once the basic problems had been overcome. He was a pure-research man, a dreamer, a man who lived for nothing but technological challenge. Characteristically, he lost interest in the Gulf-car project when it was just nicely underway. He called in Eddie Offutt, an engineer with a racing background as long as his own, and said to him in effect, "Here's what I have in mind for these cars. You finish it."

Miller bolted from Gulf in '39 and soon opened a small engineering and machine shop in Detroit. Offutt joined him there later and several years ago told me of the Big Gamble (the then-current one, that is) that Miller was staking his last cent on, at the time of his death in 1943. For years Miller had predicted that the coming thing was sports cars. He had designed one with volume production in mind and had much of it built in prototype form, the rest of it drawn in detail. It was a low, good-looking front-drive coupe on a 110-in wheelbase. It weighed about 1700 lbs and was powered by a 100-bhp six-cylinder dohc engine. The power unit was mounted transversely across the frame, ahead of the front wheels and tilted backwards at a 45 degree angle. Practically everything was unsprung weight and the odd location of the engine was chosen to put weight where it would be transferred to the driving wheels during acceleration. As usual, Miller was too far ahead of himself and of his times. And in invention, timing often is more important than idea.

A few months ago I called on the owner of a Detroit engineering firm. I was moved to see, proudly displayed in his office, a big photo of the Old Man. We talked about Miller for the rest of the day and into the late night hours. Finally he said, "Remember the old Gulf cars? The last of them is sitting in a boathouse down on the Detroit River. It's kind of rusty now and its legal status is a mess. But I'm trying hard to get it. God, but I want to see that car preserved. It was the finest thing Harry ever did."

—Griff Borgeson



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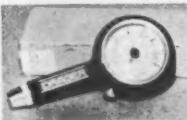
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KILO RECORD

(Continued from page 48)

on its aluminum channel frame. For these runs it burned a mixture of 15 ounces of benzole to the gallon of nitromethane (fuels and lubricants were supplied by Mobil), leaving in its wake a stench of burnt gunpowder. It had a more fiercely staccato, more physically painful exhaust rap than that of the blown Chrysler. While the Rice car could only get a tire bite with 6.75-in. wide slicks on its rear wheels, the less potent *Slipper* was shod with Firestone Monzas all around. Auburn-haired Cortopassi tooled his car to a new standing kilo average of 116.43 mph, a 10.4 per cent improvement over the existing record. His highest speed through Riley's auxiliary trap at the end of the course was 168.85 mph.

During the final runs of the day both cars ran into and against whipping winds up to 12 mph in velocity. Because of the stability of the chassis and much to the credit of the consummate skill of the drivers, neither car ever approached an even remotely precarious attitude. Under gathering storm clouds hopes of attacking the standing mile records were abandoned and within a half hour of the measurement of the engines' cylinders a rainstorm broke which flooded the course and all of Southern California for days.

Neither of the record cars' engines has been on a dynamometer. The Rice-Hartelt engine hasn't been because the dyno owner hasn't been found who will let it on his machine. On straight methanol it must be producing between 550 and 600 bhp. Beyond that it's just a question of how steeply you tilt the nitro can, and the engine has been run successfully on an 85% nitro blend. The Cortopassi engine, built by the car's sponsor, the Chev-specialist Capitol Speed Shop of Sacramento, pulls a

safely estimated 340 bhp on methanol. On 90 per cent nitro, you figure it. It, too, is too much for the local dynos.

Rice's car is poorly streamlined and its open axles and wheels create tremendous drag, a penalty the more streamlined Stuck Auto Union did not have to pay. With enclosed wheels and running gear the Rice car's potential is of course great. The *Slipper*'s body shell with enclosed cockpit is much smoother and gives less handicap to Hans Stuck's hillclimb car with open wheels, with which the fallen Class C record was set. But each of these American cars, built with notable skill from production car parts, is capable of much more speed. They are far from being unique. Rather, they are representative of the whole populous class of first-rate American dragsters. They have been given their first opportunity to prove their mettle and there is every reason to believe that, given the opportunity, these and other cars of the type can capture a great many lines in the FIA record book.

In addition to the Rice and Cortopassi teams, USAC, FIA, NHRA, Mobil, Firestone Champion and many others have labored to bring these new records into being. What is their excuse? Trite as it may sound, improving the breed is the answer. In the realms of timing, fuel, tires, engine components, fuel injection, supercharging — in just about any really functional area of the automobile that you can name — valuable new knowledge has been acquired through these record runs.

Remaining next in line for conquest by U.S. sprint specialists is Auto Union's World Record for the standing mile. It is hoped that the setting of the new kilo records will influence the FIA in recognizing a new distance over which world and international records can be set: the quarter mile. If this comes to pass the American sport of drag racing will be lifted to a new level of legitimacy and recognition both at home and abroad.

Griff Borgeson

SAAB

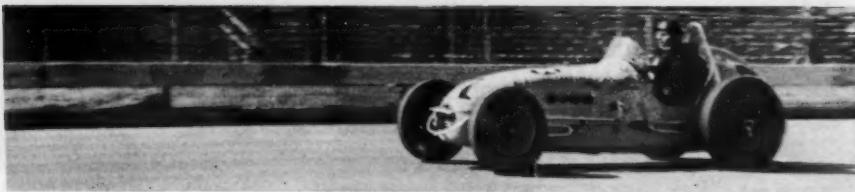
(Continued from page 31)

Handling an automobile with front wheel drive, however, is a lot different from handling one with "conventional" rear wheel drive. The steering works off a very responsive low-ratio wheel, with understeer built into the handling. On twisty roads, the best procedure is to apply throttle. In this way, the front wheels literally pull the remainder of the car around behind them. Of course, there is the tendency, on a road abundant with bends, to build up velocity.

On the Thruway, we had one of those little adventures that every small displacement engine owner will appreciate. Cruising in the 60-65 mph range, we were passed by a new Saratoga that was roaring up the road. Stopping into the next service area for breakfast, we not only noticed the Chrysler parked there, but once inside discovered that his tactics were the talk of the breakfast crowd. We ate quickly and left slightly ahead of him; but after about ten miles, the snout of the Saratoga again loomed up in our rear view mirror.

This time we held about seventy—not enough to keep him from passing, but enough to make him work at it. He passed. For the next forty miles, our Saab was flat out, up and down the hills. Several times, at the bottom of downgrades, our speedo needle hung on the peg indicating at least an honest-to-goodness 87 mph. At the bottom of every hill we gained on him, but amid a puff of black smoke from his tail pipe, he out-torqued us up the next hill. On one of our passes, he let us go by, signalling with a wave of his hand, "Go ahead, I've had enough!" As we went by, our co-driver held up a large cardboard, hastily inscribed with lipstick: "33 horsepower!" (We cheated a bit. This is the DIN rating). Demoralized, he dropped further and further back, disappearing in the distance. We're willing to bet the next service area buzzed about that little black 'furrin' car, probably called a Sa-a-ab (as in cab). We smiled as we realized that by bugging him, we'd forced him into the ten mpg fuel range, while by pushing our car, we averaged something like 25 mpg. It could be that the only reason he backed off was that he was running low on fuel!

(Continued on page 60)



The day Fangio turned left

FANGIO DROVE AN AMERICAN Championship Car for the first time in his life this spring. Anxious to have him run at Trenton on March 30th as well as Indy in May, Chris Economaki and Sam Nunis had the 4.2 liter D-A Lubricant Special flown in from Indianapolis and early in the afternoon of March 7th the trials began. The one-mile track had been swept earlier but the gusty, near-freezing wind blew much of the sand back onto one of the turns. Indy driver Johnny Thomson made four slow laps at 46 to 49 seconds to warm up the car. Pulling into the pits with his face fiery red from the cold, he explained carefully to Fangio through a translator that the 45 mph wind and sand made the car very difficult to control and that the engine's throttle response was none too even.

The champion nodded that he understood. Squeezing himself into the too-narrow cockpit, he found that the seat belt wouldn't buckle and that the brake and accelerator pedals were in unaccustomed positions. Because of these difficulties and

being unfamiliar with both car and track, he apologized that he would not be going too fast.

On the first flying lap, his time was 40 seconds. He ran four or five more laps getting down to 38. Then he brought the car in to ask if there wasn't some way he could be helped to stay in the seat. One knuckle was already rubbed raw under his glove from scraping the side of the cockpit when he turned the wheel. Each time he accelerated he slid several inches in the seat. Told that no tools had been brought to the track, he said all right and went out again, to make some twenty more laps. Under the handicap of cold, wind, sand, bad seating, and complete unfamiliarity with machine and course, he finally came within 1.77 seconds of the absolute course record of 35.21 seconds, set by Johnny Thomson in the same car last year when it was fitted with a 4.5 (270) Offy.

Fangio was disappointed with the car, as the cockpit hardly fitted him but this didn't effect his astonishing versatility. Not the least impressed was Thomson, no nov-

ice himself. (Last year at Indy he was the fourth fastest qualifier, finishing 12th in the D-A Lubricant Special roadster.)

Fangio has long aspired to compete on American tracks, but he is more concerned with what sort of car he can get to drive than he is with certain unusual financial offers that have been made by an overeager Western publisher. Asked if this trial was preparatory to an Indianapolis ride, he hedged, "No, it was just to see what the cars are like."

In the quick-change world of automobile racing, it would be rash to predict whether or not Fangio will compete at Indy or at either of the Championship events at Trenton (March 30th and September 28th), especially when even his appearance at Sebring is still in doubt. The day after the trials, he left New York for the Argentine, regrettably vague about when he might return to the States. "Soon," he hoped, and by that very word added fuel to the speculation.

—D. M. Bartley

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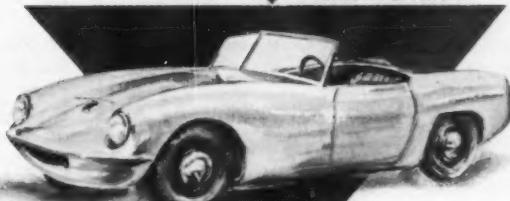
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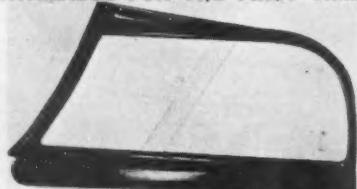
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ELVA

(Continued from page 21)

easy matter to convert the 7000 rpm shift points into actual mph. These three points were plotted on our usual graph. Allowing but a small portion of a second for the shifts (Kolb was really pushing them) and keeping in mind that the area under the speed-time curve is equal to the distance traveled, (i.e. one quarter-mile), we have come up with what we think is a fair plot of the car's accelerative ability.

Top speed runs were impossible to make and anyway, the results would have been a bit unfair with the 4.55 ring and pinion set. Estimates are a dodgy sort of business but 130 mph shouldn't be impossible to reach in stage 2 with the proper gears.

After making three runs for our regular brake test, we abandoned the efforts completely, as one front wheel was locking up before deceleration could exceed 0.6 g. Not too well aware of our brake test procedure, Kolb was all for locking the wheels for ten consecutive stops. Being more interested in testing fade than putting flat spots on the tires, we credited the Elva with zero points on this score, putting the blame squarely on insufficient maintenance since the last race. Properly adjusted, the Well-worthy-Alfin drums with TR-2 workings should certainly be well up to their job of stopping this much lighter car.

A following topic of conversation was the futility of SCCA's brake test procedure for tech inspection at race meetings. Being able to lock up all four at low speeds doesn't mean that one can necessarily stop smoothly and quickly under full control. But what would be a better test in the time allowed?

At last it was my turn to take the wheel. The first surprise had to do with feet *vs.* pedals. Despite the right hand drive, there is a place to rest the left foot next to the clutch pedal. But if you've got big feet, you find that it's a bit awkward to get on both the brake and the clutch without unintentionally hitting full throttle too. Discouraged thus from being a "nouveau Larry", we set out for a few simple tours of the original oval. First time off, we found that the clutch linkage is firm and clean; but we managed to stall the engine anyhow. In well-developed Stage 2 form, it's none to happy below 3500 rpm and practically useless under 2000.

Out on the oval we got our second surprise. The steering is just so light, quick and precise that it beggars description. True, the Elva is very light and the Morris Minor rack and pinion steering is very quick (though the 1 1/8 turns lock to lock must be explained in part by a rather generous turning radius) but the best feature of all is the consistency of feel.

Starting our tours of the oval at 5000 rpm in second gear, we went round and round, increasing revs gradually as we became accustomed to the Elvas especially flat-cornering characteristics (we don't get to drive racing cars *every* day in the week, you know). Soon we were touching 7000 on the straights and not dropping much below that in the turns. At this speed, the tail would swing well out, giving us a very vivid demonstration of slip angles; large.

Sitting out in the open, although well protected from the biting cold by the windshield, we felt much more a part of the road and aware of all that was going on than we usually do in our everyday sports coupe.

Especially fascinating was to be running right on the limit, occasionally exceeding it, yet never needing to ease off viciously on the steering. Light little corrective movements that seem to spring naturally from our finger tips were all that was necessary. When we did get the Elva cocked a hair too much, it would just drift on out a bit towards the fence. At all times the transition from one attitude to another was most smooth and pleasant.

Out on the road circuit, we found that we could just think the Elva through the few sweeping bends. A hackneyed phrase, but seemingly true. On sharper turns, especially second gear hairpins, the car easily could be made to power drift, merely by jumping on the throttle. Even as the back wheels scratched for a grip, the front ones would be pushed out too, so that frantic unwinding of the steering wheel just wasn't necessary.

A combination of more or less equal distribution of cornering loads, fore and aft, and very quick yet light steering are the major reasons for this. And don't misunderstand us with all this talk about going past the limit; the Elva sticks like you-know-what and it takes a very determined effort, gritted teeth and all that, to boot it around hard enough so that it does start sliding away.

After about a half hour of playing Jack the Bear, we could see how cold Charlie had become, so we reluctantly called it quits. With the Elva soon back on her trailer, we headed for the nearest cup of hot coffee.

The Marks II and III are both serious attempts to crack the Lotus-Cooper monopoly of the highly competitive 1100 cc class, and the fair sized market that has developed for these cars in the USA. While all use the now ubiquitous Climax "fire-pump," they are basically quite different from one another. Though the Elva is conventional in layout, i.e. front engine, rear drive, it differs especially in making more extensive use of what in its home country are called "proprietary" units.

For example, the front suspension is almost entirely Triumph TR-2 Spares for the backing plates, spindles, wishbones and all the associated bearings and bushings are thus as close as the nearest Triumph dealer. The springs, both front and rear, are Armstrong combined coil and shock absorber units (part number 03521). The brake drums are Wellworthy-made Alfin units for a TR-2; they have to work at much higher speeds here, but the weight to be stopped is much less. The front ones have radial "turbo-fins" while the rears are finned more conventionally.

The light weight rack and pinion steering gears are from the Morris Minor and so is the nose piece or "pumpkin" of the differential case. The rear portion is the very same magnesium casting which Chapman uses on the Lotus. Its sides are suitably machined to receive, in order from the center out, a slim nylon oil seal, an Italian RIV ALN 30 self-sealed ball bearing (they are alleged to last and last).

and finally the backing plate which mounts on an external flange.

Torque is transmitted to the wheels by double U-jointed shafts. The splined inboard end of a Minor axle shaft has a flange arc-welded on to accept the companion flange of the Hardy-Spicer universal joints. The latter units, both inboard and out, are from the Minor's propeller shaft. So are the sliding splines, and naturally enough, so is the propeller shaft itself. All of this complication is to enjoy the light unsprung weight of a de Dion rear end.

The de Dion tube, about $3\frac{1}{2}$ inches in diameter, lies to the rear. Towers erected from it, about a foot each side of the center line, tie in rubber bushed radius rods of $\frac{1}{2}$ inch diameter, twelve inches long. Lower radius rods are made of boxed sheet steel. In addition, these carry the bottom of the coil-shocks just ahead of the downward projecting brackets on the de Dion tube. Lateral location is effected by a one inch diameter roller pinned to the rear of the de Dion tube on a longitudinal axis. It rides within a well-greased, channel-shaped vertical slide which is welded into the frame on the centerline.

The frame is a modified space frame of tubular steel. Only a few members work in bending, the majority of the structure being loaded in tension or compression only. Outside diameter varies from $1\frac{1}{4}$ inches for the lower rail, the cross-members, the forward upper tube, and the uprights to $\frac{3}{4}$ to $1\frac{5}{16}$ inch for the remainder. Some of the mountings are rather ingenious, such as the spare wheel which is tied down with elastic shock cord. Others seem more cumbersome, the attachment of the diff case coming to mind here.

Upon reflection, the deepest personal impression of testing this car on a race course was the realization of the time-scale effect. No matter what the speed potential of a car, navigating a particular bit of roadway demands certain maneuvers on the part of the chauffeur. The slower the car, the more time there is in which to plan and execute them; conversely, the faster it is, the less time there is and the more accurately they must be accomplished.

In other words, being a hotshoe at Lime Rock in an Austin A35 is a far cry from being one in an Elva. Perhaps this is something for would-be purchasers to consider before laying cash on the line. If you think you can do the car justice, then go ahead, for the Elva will surely do its share for you.

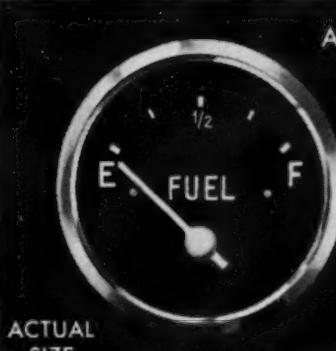
The entire conception of the Elva is purposefulness combined with economy. The execution is achieved with simplicity, an always admirable trait. This machine is designed to go sports car racing, and while successes may be expected, operating costs can certainly be counted upon to be within reason.

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(Continued from page 25)

ahead could not be determined, but light snow had begun to fall. The townspeople, gathered around to greet us laden with bread, cheeses and wine, and tried to help by describing some of the bad spots that we would be encountering in the next hundred miles. We took none of this too seriously. So a little snow was falling; that's what we expected on this rally, and we were well prepared for it!

As we started getting higher in the mountains, the snow began falling harder and we found ourselves in the middle of a winter wonderland. We didn't realize it, but at this altitude, snow had been packing for weeks and most of the roads never saw a snow plow. Doug kept asking about my capability and experience as a snow-driver, and I kept assuring him that in my younger days I did nothing else but practice on the mountain roads of Tarta in Hungary in preparation for just such an event as this. Nevertheless, he kept giving pointers. I was certain that if we survived this night together we would be friends forever.

In some places the snow was falling so hard that we needed extra defrosting units to keep the windshield wipers working. We were passing cars stuck in ditches or snow banks pretty regularly now, but we were still within our time. I had been following a red Porsche, when suddenly I saw him spin, pull out and continue at about 10 mph. This warning saved me. I had enough time to slow down before hitting the next section of the road. Without any exaggeration, it was as slick as an ice rink and was a slow downgrade where you had to control the car with the tips of your fingers and the tips of your toes. At least four cars before us went out in this section, and it was a relief to see snow again.

There was about 6 inches of freshly fallen snow over the older packed stuff, and everyone followed in the tracks of the preceding cars. Snow covered all the road signs, and our odometer was off because of so much wheel spin. We didn't have the slightest idea as to where we were and could only hope the tracks were leading in the right direction. Our Halda showed that timewise we were still okay, but we were afraid at this point to trust it and decided to make as much time as possible. This was a mistake, for I went into a curve too fast, spun around at least three times and wound up tail-end in a snow drift blocking half the road. We knew there was a Porsche coming up fast behind us, so we were out of the car in a flash, got the tail out, pointed the car ahead and sped on. I was cursing because there was a dent in the left fender that would mean 40 demerits when we reached Monte Carlo. In the next half hour I lost tally of the demerits!

There was no let up in the snow, and visibility was about 2 or 3 feet. Trying to maintain a 47 mph average was not only idiotic, but impossible. I came up on a Mark VII Jaguar, driven by two British military-type gentlemen, and had to pass them. Needing their cooperation, I gave a

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beep on the horn. The car moved over to the right and *disappeared*. They obviously hadn't determined the width of the road, and because of their courtesy, drove into a gorge. We stopped to see if they were dead, and two hundred feet below we saw their lights. We called, "Are you all right?" A faint reply: "Yes. Did you pass okay?"

The whole night was full of incidents. There were three cars that we passed over and over, and we couldn't figure it out until later when we were told the story. The first car spun out; the second car, coming up close and fast, went into it; then the four drivers calmly waited for a third car to hit them. They needed six men to work at one car to get on the road again. When all the cars were freed, they sped like mad until the whole process was repeated. This must have been done a dozen times before the game was broken up by the first car, a Ford Anglia, which went so deep into a snow drift that only a Spring thaw would get him out. Tiny Lewis, who was in the second car, was confident that another car would join them to make up a trio again, so he went by.

Then my eyes started playing tricks on me. Even my glasses didn't seem to ease the strain that resulted from so many hours of steady concentration on the patterned snow. I don't know how many miles I drove with almost complete blindness when suddenly my eyes registered a red light flashing a few hundred yards ahead. To touch the brakes would have been disastrous. The contour of the road was a complete blank until I found myself in a left-hand curve with a three car smash-up almost dead center. I knew there was someone injured. But there was no stopping so I told Doug to hang on and with a "Here we go," we went. We bounced off the banks so hard that the car did a right side flip and we landed roof-side down. We slid down the road upside down until we hit another snow bank, providing a fairly gentle stop. Doug got off my head and we crawled out. With the help of two Frenchmen, we turned the car over and continued with a loss of some photo gear, 4 minutes, and 3 quarts of oil.

Doug had had enough of my snow driving. He reminded me that he drove his Ford Station Wagon to Mt. Snow each weekend to ski, and that he was more up-to-date on this stuff. I felt there was something wrong with this theory, but since he endured my tribulations, I turned the wheel over to him. A few minutes later we went into a curve too fast.

We went through the outside snow bank. The car came to a peaceful stop with its frame on the shoulder of the road, front wheels a foot below in the snow and rear wheels in the air. We checked the watches before we got out: we were 10 minutes late. We tried jacking up the front, only to have the jack sink into three feet of snow. We tried our handy-dandy pulley from Abercrombie & Fitch, but the rope was a few yards short of reaching the nearby tree. We tried digging under the frame but the earth was frozen solid and our aluminum shovel wouldn't penetrate. We pulled it, sat on it, shoved it and I'm sure I kicked it, but nothing would give. Meanwhile, other cars that were still in working condition fishtailed by us. In the best Monte manner, we waved and urged them on.

(Continued on page 58)



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Monte Carlo (Continued from page 57)

After an hour of futile struggling, we saw car lights coming from the other direction. The little 2CV came to a stop without as much as a slide, and two giant gendarmes unfolded themselves from it. They soon realized what our trouble was, so they went to our car, picked it up, and put it back on the road. It took them two minutes, and it all looked so simple. Why couldn't they have come by an hour ago? We tried to reimburse them but they shook their heads.

After losing our way a few times because there were no tracks to follow, we finally came upon a check point. We were told that we were 15 minutes over the allotted time, which meant disqualification! But we were in the majority. Only 3 cars out of the 91 starters from Paris got through this point, and these never finished.

We found the big room of a nearby restaurant filled with many drivers and many mixed emotions. Some were happy; others were frantically making arrangements to have their cars picked up; Doug and I decided to go on to see what the rest of the rally was like.

As we approached Monte Carlo, crowds cheered us on towards the finish. Embarrassed, we sped by as fast as we could. We watched the 59 cars still competing arrive: none from Paris; one or two from The Hague; 1 out of 28 from Munich; 9 out of 92 from Glasgow; the remainder from Lisbon, Rome, Athens and Oslo.

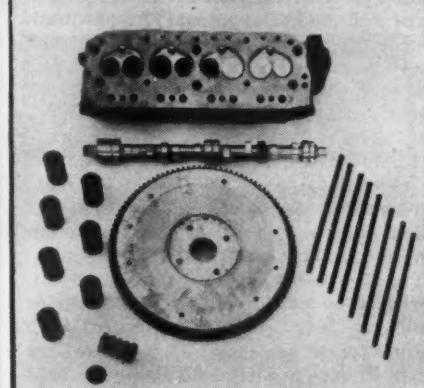
That night we went up to the mountain circuit to watch these cars give a hair-raising performance on snow covered, twisting, narrow roads up some 12,000 feet with average speeds sometimes as high as 50 mph. All of this after the initial 40 hours of hazardous driving! We felt pangs of regret not to be competing but they were eased after learning only 21 cars were able to finish. Every year the awards to the winners are spectacular, but this year they took second place to the little lapel badges handed out to those who finished!

When we got back to our hotel, we met the British gentleman who took the dive with his Mark VII. He was happy and smiling and with a poke to my ribs said, "Jelly good rally. Eh what?" I wondered what a bad one would be like.

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—Robert Halmi



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PORSCHE

(Continued from page 39)

than one rabid Porsche owner objected to being forcibly civilized in the name of Progress and Stability, complaining that the 356A, far from being in the Bugatti tradition, now seemed to be descended from one of W. O. Bentley's smaller lorries. When pressed for reasons, sources at Zuffenhausen took refuge behind references to the demands of the American market (!) or else insisted that this represented a real improvement in handling and was, in fact, necessary with the added power of the Carrera. Be that as it may, the Porsche-pushers at SCI all drive the earlier 1500s and like them. One thing we will admit is that the 356A series certainly rides better, being nowhere near as choppy as the Type 356s.

The 1958 1600 coupe which we have tested seems to nicely combine the best of its predecessors' advantages. The ride is comfortable and yet the steering is delightfully sensitive and light, requiring only fingertip control. Speeding down long straights with severely undulating surfaces again brings up that fascinating phenomenon of going straight on in a car which alternately points a degree or two to one side and then to the other. The value of independent rear suspension in soaking up roughness must become obvious to anyone who rides in a Porsche on bad surfaces. The wheels may go pitter-patter but the occupants are thoroughly insulated from it.

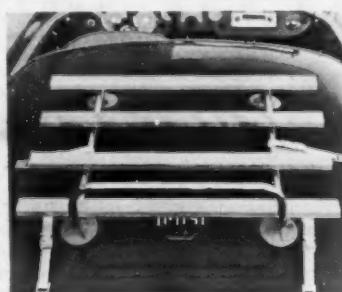
While its performance is no longer considered shattering, it certainly is a delectable car for serious cross-country touring. Though the Porsche's trunk is hardly cavernous, there is plenty of luggage space available in the back seat. The logic here seems irrefutable: if you've a back-seat passenger or two, you won't be going far because it's not *that* comfortable back there; if you haven't one, then the jump-seat may be folded to provide a wide, flat loading platform. A supplementary piece of fabric covers the gap through which small objects could fall, while a lip on the upper or forward edge of the seat back will keep parcels from sliding off under sudden braking.

Much of the well-sealed trunk itself is occupied by the spare wheel and the gas tank. The latter is to the rear, the former to the front with luggage space in the middle. Worries of ruptured gas tanks can be put to rest. The VW-like front suspension beam, the spare wheel and the welded body-frame add up to an impressively non-resilient structure in the event of a head-on collision, all of them well ahead of the gas tank. Inside, the dash board crash padding looks good but we doubt if Dr. Snively would be impressed.

Visibility is very good but in the rear, it seems the wiper blades could be usefully pivoted one or two inches further outboard. The instrument panel is simple and straight forward; so much so one staff member likened it to the Henry J. (?) Keen rallyists will welcome the odometer with tenths and the speedo unit's position

(Continued on page 60)

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SAAB

(Continued from page 52)

Leaving the Thruway, we had forty miles of twisty, treacherous road to go. We made excellent time, held up only by the few who feel the purchase price of their car entitles them to the middle half of the road. We hesitated to pass one new sedan, of a make held in considerable esteem by those who own them, because it was wallowing and sliding so badly that we were afraid he would break loose and slide into us as we passed. This fellow, with about 300 inches of displacement and almost 200 horses per passenger, was holding up our Saab!

Arriving at the approach to the ski slopes—a mile-long upgrade with a base of ice covered by several inches of snow—we were confronted by a myriad of cars in different states of immobility. We picked our way between them, frequently stopping and restarting on the slick surface. At one point, where two cars were stuck on the two-lane road, we took to the edges. The two right wheels dropped off in the deep snow, sliding us on the belly pan, but we pulled back on the road and drove up the rest of the way.

The Saab is obviously a remarkably well-built car. The gauge of the body metal is heavy, with many of the stress areas, such as at edges of the windows, welded. There is a tubular steel roll bar across the roof and each car is undercoated in sections during assembly. The dash panel is metal, stressed in such a way that it will collapse upon impact from inside the cockpit. I was told that the fiancee of a Saab engineer in Sweden slammed into the panel, leaving the imprint of her nose in the metal, but her nose didn't break! She should have taken the time to fasten the excellent and very comfortable safety belt.

Saab's safety belts fasten to the body frame; they're sturdy, not the kind that you snap on to the upholstery. The belt passes over the left shoulder of the driver (the right shoulder of the passenger), joining the buckle section that comes up from between the bucket seats. This belt secures the shoulders as well as the waist, and is installed so that it never touches the floor. It's an extra, but Saab extras come easy.

For example: How about a nice quick hop-up, for five more horses? Various size carburetor venturi inserts and high-speed jets are available, and can be changed in

ten minutes by anyone who owns a wrench and a screwdriver. By installing bigger passages, the richness of the mixture is unchanged, however more of it can be introduced. Cost: two dollars for the venturi, fifty cents for the jet!

When we discussed this with Chris Custer, Saab service representative, we explored the possibilities of a man installing a high-economy setup for his wife to take shopping during the week, and on Friday night, before he packed off on a 400 mile ski trip, changing back to a larger venturi and bigger jet for more go. We asked him if this was feasible.

Chris drove into the garage and took off his tie, but he left his white shirt on, merely rolling up his sleeves. He timed the car, adjusted the points, changed the plugs, and installed and removed two or three different venturi-jet combinations. (We kept the "regular" combination for performance testing). When finished, he washed his hands and rolled down his sleeves. His shirt wasn't soiled.

However, the Saab is not designed as a do-it-yourself-service car. Timing is critical on a two-stroke engine, and unless it is hitting "on the head", fuel consumption will suffer tremendously. The Saab is timed by measuring the hundredths of a millimeter the piston is below top-dead-center. The #2 spark plug is replaced by a metal insert with a hole drilled through the center. A gauge with a rod, the same diameter as the drilled hole, seats on the insert, and the rod, hitting the top of the piston, records the *distance*. Since this method overcomes errors due to wear, it is extremely accurate.

The Saab merchandising program is built on solid service. Once a dealer is franchised, he must send a mechanic to Saab service school at Hingham, Mass. If he doesn't, he doesn't receive any more cars. This depot also stocks spares for several hundred cars, available quickly and at moderate cost. A rebuilt block, including crank, pistons and head, costs \$149.50; a factory-warranted block, complete as before but also with carburetor, distributor and manifolds, costs \$299.50 exchange.

All in all, the 93B incorporates an awful lot of things that most small car owners like to have in their cars. The \$1895 purchase price gives you room for four full-size people, massive stowage space, heater, comfortable seats, durability, and plenty of outright economy. And if you want to race in the 750 cc class you can probably win, unless another Saab beats you.

—Len Griffing

PORSCHE

(Continued from page 59)

at the right.

The offending interior light has been removed from top dead center on the dash board, leaving it with a somewhat blank look. Now there are two of them, individually controlled and/or automatic, one above each door post. Sealed beams do not seem really at home in their containers either here or in the VW. The pattern ahead seems fuzzier while light to the

side is much reduced. Full positive marks for the headlight flasher button in the horn ring, an idea others should copy.

The fully reclining seats always win praise—and perhaps a few cries of surprise from the unwary. This year they are much firmer than before—less opulent, but with better lateral support. This pleased most yet annoyed others. Leg room can still be a bit of a problem for the driver. Here's how. Though the long seat travel assures plenty of fore and aft room (is there any other car where a six footer can't even reach the toe board?), the driver's left foot has only a small space for resting and even this is too far to the right.

A rather rare right-hand-drive Porsche, sampled some time ago, was infinitely better in this respect, especially when navigating hard right bends. It's all caused by the short wheelbase and the way the front wheel-well encroaches on the driving compartment.

In view of the fine new Ross steering gears, developed on the Spyder, the provision for the first time of a 17 inch diameter steering wheel seems unnecessary. The old 16 incher is available on special order and we definitely recommend it. It gives less interference with the driver's entrance to the car at the cost of 6% more force required at the rim.

In this day and age, the provision of a hand throttle comes as a bit of a surprise, especially on a rear-engined car. It connects ingeniously to the foot pedal and it locks at any desired idle (up to about 3500). This permits that second cup of coffee to be followed by a ride in a warm Porsche. In fact, the factory recommends a warm-up at 1700 for a minute followed by not over 3000 rpm driving until the oil reaches running temperature. Numbers no longer appear on the oil temp gauge though, only a wide green band with a narrow red one to the right. It seems that the numbers on the older gauges were more detailed than the gauges were accurate and many customers were worried because their car ran consistently at 140° F or 220° F—not very close to the 180° which is average, but not to be worried about either. The factory's cure—take off the numbers. We're lucky to have the gauge, I suppose.

The other minor gauge shows the gas level in the tank, but there certainly aren't any baffles in the tank, for this needle swings back and forth most erratically. So much so that we pretty much ignored it, much to our embarrassment late one night when we went a nervous 16 miles on the reserve tank before finding an open station.

The gearshift lever has been moved back several inches, changing places with the heater twist-knob. At the same time, the Mickey Mouse linkage (under the back seat bulge) has been usefully modified to reduce the travel. This reduction in mechanical advantage ups the forces involved a bit, but it's a small price to pay for the big gains.

The engine features several changes. Dual choke Zeniths replace the single throat Solexes, permitting a throttle linkage less sensitive to engine temperature (what odd problems designers have with unorthodox layouts!) as well as vastly improving the low speed smoothness. Full throttle in fourth is smooth even below 1500 rpm.

The chrome plated aluminum cylinder barrels have been replaced with cast iron ones. When worn, these may be rebored and fitted with oversize pistons, which is much cheaper than buying a set of matched barrels and pistons. Presumably the factory is convinced heat dissipation is still satisfactory.

The heater, usually a bugbear on air cooled cars, is more than satisfactory even in extremes of cold. But three people leaping into a cold Porsche can get a headstart on the windshield. Small gates can completely close the heater outlet, deflecting all the air into the defroster ducts, which

(Continued on page 65)

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GP CAR

(Continued from page 29)



maybe put a buck down with Mr. Charles Delanoy Morrison, just to see his face when you dust off his whole Scuderia."

Then I explain that just money isn't everything. Morrison has Maserati tied up this year — he gets every car the factory team is done with. And the factory cars are always just a little bit faster than the copy. Kingsbury has Jaguar. And B. J. has Ferrari. Daimler-Benz doesn't sell their racing cars and neither does Pignatelli, who at the moment, with Gomez up, is a cinch for the F.I.A. Manufacturer's championship.

Dino lights up a large Havana and gives this all of three minutes thought. "If you had a Pignatelli — same thing that Gomez drives — you could win, no?" Yes. Dino gets up and drives away in a cloud of three-buck cigar smoke. This time I expect to hear more and I do. Tuesday night, Dino's chauffeur (he's really a third cousin or something) drives in with the Fleetwood Limo — the black one — and announces Mr. Partelli requests my presence at a phone conversation to take place in his New York apartment. Now. So we go. On the way, the chauffeur explains that Dino has been on the wire with Pignatelli all day, but he gets a polite, "No we don't sell our sport-racers," in English, French, German, Spanish, Greek and finally even in Sicilian when he loses his temper.

Now he is making a few calls up and down from Rome to Capri, from Naples to Monico and to Antibes, too. When we walk in the walnut panelled library, Dino gives me a big grin. He has finally located his party.

The conversation should be quoted exact, so here it is:

"Goldie? Dino. The other guy there? No. Personal. Lemme talk."

"Charlie? Dino. I want you should do me a favor. You know Pignatelli. I want you should buy me a car. Charlie. Don't hang up. Only you can buy it. They won't sell even to Frank. Yeah, a red one. Like the races. Look, I'll put on the kid — he'll tell ya. Make Max write it down.

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No — what happen? He fell? All the way into the ocean. From back there? Tsk Tsk. All right, I'll put him on."

Next thing I know I am talking to Charlie Lucky himself, and I am glad it is long distance, since I understand this guy looks at you crooked and you are liable to become very ill. My personal experience is that he is extremely polite and cooperative, as I give him the details of the car Dino would like to buy. Only one thing puzzles me. And the end of the conversation he says very clearly — "I hope your ears drop off." That's all. I was quite taken aback until I realized he meant this for a third person on the line. I later discovered Charlie Lucky invariably ends his phone conversations with this phrase. It must give them a chuckle at Mr. Hoover's office.

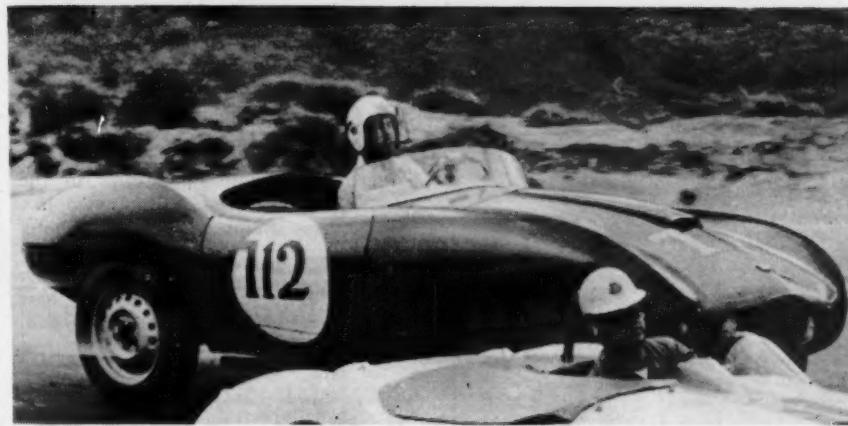
Not more than three days passed when I got a cablegram to meet Goldfarb & Goldfarb, Attorneys at Law, at the Pignatelli plant in Turin. I got a seat on the next plane.

A big old Isotta-Fraschini met me at the airport, and in no time at all I was in the office of the Director General, in the company of Goldfarb & Goldfarb, attorneys, London, New York, Rome and Paris. I don't have too much knowledge of attorneys — Chuck Williams is one, and he takes the chute too fast at Lime Rock — but these international attorneys look like Bleeker Street collection agents to me. All very Latin, very sharply dressed, very big, very quiet, and very loaded with artillery. All except one who is a slight, middle aged man rather quietly dressed, with an old fashioned snap brim fedora pulled down over one eye like Jimmy Cagney used to wear in the movies. I didn't know you could buy such hats any more. And then I realize this is Charlie Lucky himself, and he has just bought himself an automobile.

Dr. Ing. Zucari, the chief engineer and designer for Pignatelli, walks us down to the test track to inspect the car. I guess the usual word to describe a freshly painted, brand new Grand Prix sports-racer is sleek or smooth. Believe me, this wasn't either. It was a brute and it looked like one, sitting there ready to belch fire and throw itself through stone walls. The body was smooth all right, where it wasn't broken by scoops for air to the fuel injection, to the front brakes, to the oil cooler . . . where there weren't holes to duct the radiator, and the engine compartment, and the cockpit, and the rear brakes . . . where there weren't little doors to put in oil and water and gas and auxiliary gas, and to extricate the driver from the plexiglas cocoon over and around the cockpit. This was no Concours D'Elegance winner . . . this was competition machinery; it was more like an M-3 Tank than a Detroit Dream Car.

Zucari and a bevy of mechanics showed me the insides — 12 cylinders in a Vee, 5½ litres big, gear driven overhead cams (four of 'em), fuel injection, desmodromic valving, twelve little motorcycle magneto's stuck up under the hood, brakes as big

(Continued on page 64)



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GP CAR

(Continued from page 63)

as the wheels in the front and a big flat plate brake mounted amidships in the rear. When I started it, it sounded like four express trains caught in a hotel bathroom.

I took it around the banked track in first gear, trying to figure out just how I'd ever get up the guts to try second, much less third, fourth, fifth and then fourth and fifth in the alternate "high speed" box. I don't mind telling you I was a little bit afraid of this car. But I got around and stopped just where Lucky and his attorney friends were waiting. As I climbed out the little man climbed in, pearl grey fedora and all. I tried to tell him it was very uncomfortable, and maybe dangerous. He didn't even look up from the dashboard, just grunted "I drive" in a monotone of peculiar authority. Maybe it was one of the lawyers advancing on me that made me step back and leave it all to fate, like when you feel the rear end lift and you're already half way through the haybales.

Lucky turned on the lights and then turned them off — I hadn't even noticed that it had lights; he ran the extra fuel pump for awhile and then he started and stalled the car three times in a row. I figured he'd be discouraged, and I'd somehow get back into the seat, when the engine blasted about 8000 rpm with no load, the gearbox clanked like a steel girder snapping, and he was off in a cloud of burning rubber.

In spite of all the noise I swear I heard him blow that silly little beep-beep of a horn just before he caught a mechanic on the offside fender and threw him fifty feet in the air. By the time the guy hit the ground, Lucky hit the first corner and he must have been doing 100. The car didn't swerve a bit as the brakes took hold — what a fabulous suspension! — but in all the excitement I guess he forgot to steer. He just went straight as a die, more slowly now, right up the high bank of the track and off into the setting sun. As the rear end caught what was left of the fencing, the gas tank exploded and the car couldn't have been moving more than 40 miles an hour. What it was doing

when it hit the concrete at the bottom of the hundred foot drop, I couldn't tell you.

When I saw the orange flames and black smoke shoot up behind the hole in the fence, I knew they wouldn't need a driver for that particular car anymore. So I started to look for a means of transportation. I noted that all of Charlie Lucky's friends had gone running up the track, but I suspected that a couple of the more vindictive ones might turn back in their agony and look for the guy who brought Lucky to this undignified end. So I stepped into a little Gran Turismo Piganielli at almost the same time Dr. Ing. Zucari got through the other door. He gave me the hand signal for "speed" in the true Factory Team manner, and off we went. I was so busy steering through downtown Turin at 5000 that I never did have a chance to look in the rear view mirror and see what happened to all those poor mechanics.

Zucari and I parted at the airport. It seems he had a long standing offer from a firm in the Argentine to develop a steam car designed by Dr. Porsche in one sleepless night. Zucari thought this was the opportune time to accept. He assured me his wife would mail him toilet articles when he arrived on the Pampas.

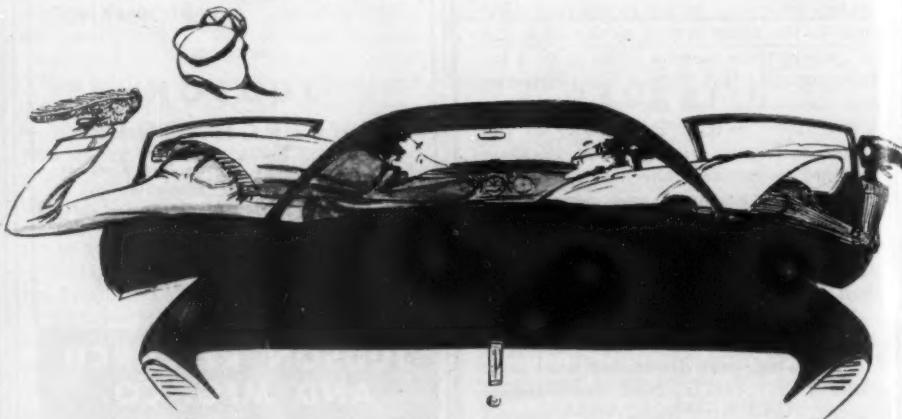
I caught the midnight plane back to Idlewild. It was bumpy and uncomfortable, and I needed a shave, but it was very pleasant to be alone and away from Italian machinery for twelve hours.

No I haven't heard a thing since, and I've been back for almost two months. Well, I mean I haven't heard anything about Charlie Lucky. Two days after I got back, Big Dino's son drove up in a Jag — the gray one — and told me his father had developed a big hatred of sports cars. He had to sell his Jag and the red one, too. But quick. So I sent him to Jake Larson. But I haven't seen Dino or any of the Caddies since that day.

Only a couple of ugly looking fellows told my old man not to sell gas to sports cars any more. Seems the noise and the traffic were running down the neighborhood. Especially red sports cars. I can take a hint. So that's why I'll meet you up at the course.

You'll recognize me. I'll be driving that old DeSoto sedan. The one with the bullet-proof glass.

Robert G. Lurie



PORSCHE

(Continued from page 60)

quickly clears it.

Noise, also a serious problem on air-cooled engines, is combatted by many layers of insulation. Though adequately subdued, it's still noticeable.

Engine accessibility, as before, is great for minor operations but a real pain in the neck for changing spark plugs and adjusting valves. The latter involves lying on the ground and there's not much that can be done about it. But why can't the engine lid be made larger, especially at the forward end? Reaching the forward two plugs takes an acquired knack and the only solace is that it's tougher on a Carrera (twin ignition and the same lid.)

Otherwise, maintenance is a snap. Greasing involves but twelve fittings on the trailing like i.f.s. and the unequally divided track rod steering (every 1500 miles) with rarer attention to clutch and hand-brake cables.

Brakes scored highly on our test. Though helped in avoiding fade by the extreme cold, they are good brakes and well predate domestic efforts in the same direction. The Porsche's drums are of aluminum which is cast onto a ferrous braking surface (and a splined hub, at the rear). Similar, if not identical, to Fairchild's Alfin process, there is an intermolecular bond between the two metals which gives additional strength and better heat conductivity than the Buick system of cast-in dowels.

Bumpers are much in the European tradition being lightly made of thin gauge body steel. Their weakness in American parking traditions is overcome by an extensive system of bumper guards and bars. Ideal for hanging badges on though, if pure aerodynamics bore you.

It's very hard to write a road test on a car which has remained essentially the same for so long, especially when you've been driving one of them yourself for three years. So I will add a purely personal note, full perhaps of prejudices. I like my '54 Super coupe very much indeed (although roller-bearing crankshaft are expensive) and I probably will continue to drive it for quite a while longer. But the improvements of the '58 are indeed tempting, especially since the car handles so much more lightly and smoothly than all the 1600s which preceded it. Porsches have always been delectable motor cars, and in this one they have reached a new peak. If you've ever liked the Porsche before, then I can recommend the '58s without reservation. If you demand more acceleration than is offered by this model, then the new Supers (which no longer have roller cranks) appear to be very good bets, although at a hefty price increase for a power-pack. Those who feel Porsches are too expensive should give one a careful looking over to realize the amount of value received.

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Stephen F. Wilder

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INDEX OF ADVERTISERS

ADVERTISER	PAGE NO.	ADVERTISER	PAGE NO.	ADVERTISER	PAGE NO.
Accessory Engineering	59	European Motor Products Inc.	58	Polk's Model Craft Hobbies	46
Almquist	65	Fisher Products	3, 55	Post Motor Books	63
Arnolt Inc., S. H.	63	Foreign Speedometer Sales and Service	62	Prentice-Hall, Inc.	65
Art Center School	46	Gordon & Co., Inc., R.	50	Purdy	65
Autobooks	13	Hambro Automotive Corp.	Fourth Cover	RAJ Racing Enterprises	50
Bentley, Inc., Robert	9, 17, 51	Haan, Vilem B.	6, 64	Ramcote Products	64
Billmar Inc.	50	Heath Company	44	Ravesi's	58, 62
Blason	56	Heath Co., Roy M.	46	Remco Accessories	62
British Auto Parts	16	Hi-Fi Guide & Yearbook	62	Riverside Records	45
Castrol Oils, Incorporated	49	Hoffman	10, 11	Rootes Motors, Inc.	15
Cerbini Laboratories, Inc.	58	Hoffmann-Porsche	59	Sherman Way Auto Wreckers	62
C & F Engineering Co.	62	Iskenderian, Ed	60	Simca, Inc.	18
Charmont Imports	57	Jesse Jones Box Corp.	60	Standard-Triumph Motor Co.	43
Checkpoint	56	Judson Research and Mfg. Co.	57, 63	Stevens Engineering Co.	62
Chevrolet Division of General Motors.	7	Lucas Electrical Services, Inc.	61	Stevens Plastics	56
Citroen Cars Corporation	Third Cover	M. G. & C. Co.	58	Studebaker-Packard Corp.	47
Columbia Motor Corp.	54	Michelin Tire Corporation	14	Surrey Sports Cars	65
Competition Accessories	52	Mitten, MG	12	Thoroughbred Car Company	64
Continental Motors Ltd	53	Omega Service Parts Corp.	61	Toptex, Inc.	56
Continental Tags	62	Ossie & Reg	64	Universal Laminations	54
Devin Enterprises	48	Photography Directory	58	Victress Mfg. Co., Inc.	64
Dietz Engineering Co., O. W.	64	Plasticon Inc.	56	Volvo	5
Dunlop Tire & Rubber Co.	8	Plymouth Division,		Weber Tool Co.	50
Edith's Terry Covers	56	Chrysler Corp.	Second Cover	Witte	46
Electronic Experimenter's Handbook	50				

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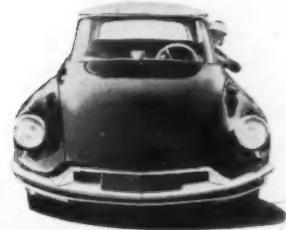
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